

WIRELESS SYSTEMS MANAGER



SENNHEISER WSM Instruction manual



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Important information regarding this instruction manual



Additional information on the "Wireless Systems Manager" software can be found at http://en-de.sennheiser.com/service-support/wsm.

Additional information on the transmitters and receivers can be found in the individual instruction manuals on the product pages at www.sennheiser.com.

For your safety

Individuals who are not trained in the operation of computers can unintentionally alter computer files, corrupt or erase them. Ensure that only competent individuals operate the computer on which the WSM software is installed.

Always make backups when you create or edit configurations and store the backups in a safe location.

When you are using a firewall, please provide access via the corresponding ports for the WSM.

Capabilities of the WSM

The "Wireless Systems Manager" (WSM) is the professional software for remote monitoring and controlling Sennheiser wireless microphone and monitoring systems. Due to its intelligent features, the WSM software is the ideal solution for use in TV studios and shows, live performances and musical productions.

Using the WSM software, you can:

- · display and monitor the connected devices,
- configure the connected devices,
- perform a frequency preset scan (see "Frequency management" on page 33),
- control 2000/3000/5000/6000/9000 systems and ew G3 systems, combined systems and multi-channel systems,
- update the firmware of the receivers and the transmitters,
- listen to live streams over RTP/RTSP or using Dante (only supported by EM 9046 receivers, see "Configuring streaming" on page 84).

The following Sennheiser systems can be configured using the WSM:



Only transmitters and receivers that are equipped with the same compander system can be combined with each other.

System		Compander system	Receivers	Receivers	Charger
Wireless monitoring system	2000 series	HDX	portable: EK 2000 IEM	stationary: SR 2000 IEM SR 2050 IEM	-
	ew G3	HDX	portable: EK 300 IEM	stationary: SR 300 IEM	-
	ew G4	HDX	portable: EK IEM G4	stationary: SR IEM G4	_
Wireless microphone system	ew G3	HDX	stationary: EM 500 G3 EM 300 G3	portable: SK ew G3 SKM ew G3	-
	ew G4	HDX	stationary: EM 300 - 500 G4	portable: SK ew G4 SKM ew G4	_
	2000 series	HDX	stationary (2000 series receivers): EM 2000 EM 2050	portable: SK 2000 SKM 2000 SKP 2000	-
	3000 series/ 5000 series	HiDyn <i>plus</i> ™	stationary (3000 series receivers): EM 3732 Command EM 3732 EM 3731	portable: SK 5212 SKM 5200 SKP 3000	-
	Digital 6000	-	EM 6000	SK 6000 SKM 6000	L 6000
	Digital 9000	-	EM 9046	SK 9000 SKM 9000	-

System requirements

Required hardware

Processor:	Core i-series processor, 2.4 GHz or similar
Memory (RAM):	Windows: min 4 GB / Mac: min 8 GB
Hard drive:	min. 500 MB available
Ports:	Ethernet port (min. 100 MBit/sec)
Screen resolution:	min. 1280 x 1024 pixels



If your hardware complies with these requirements, you can operate the WSM with approx. 32 channels.

Required operating system

The WSM software runs on the following operating systems:

- Microsoft[®] Windows[®] 7 (32 and 64 Bit)
- Microsoft® Windows® 10 (32 and 64 Bit)
- Apple Mac[™] OS X Sierra (10.12)
- Apple Mac[™] OS X High Sierra (10.13)

Putting the system into operation

Installing the WSM software

To install the WSM software on your computer:

- Download the current version of the WSM software from the product page at www.sennheiser.com.
- Close all currently running programs, including those running in the background (e.g. anti-virus programs).
- Start the installation by double-clicking on "setup.exe" (Windows) or "Sennheiser_WSM_Setup_MAC.dmg"(Mac).
- Follow the wizard's instructions. The installation wizard suggests installation on the program folder on the "C:\" drive as the subfolder "...\Sennheiser\Wireless Systems Manager" (Windows) or Macintosh HD\Programs (Mac).

You can change the install path by clicking on "Change directory".



You can install the WSM software on several computers in a network (see "Using several WSM softwares in a network – multi access function" on page 7).

Configuring the network

All devices are factory preset to automatic IP address assignment.

To enable communication between the WSM software and the connected devices, configure the network (LAN connections) as follows:

Automatically obtaining an IP address

- Go to the Network Settings in your operating system.
- In the Internet Protocol (TCP/IP) Properties window select the "Obtain an IP address automatically" option button for PCs or the "Configuration DHCP" option button for Macs.

The assignment of an IP address may take some minutes. With this, the configuration of the network is terminated.

- Only launch the WSM software after having configured the network. For information on how to connect the transmitters and receivers to the computer, please refer to the individual instruction manuals.
 - If you want to use several WSMs in a network, please follow the instructions in chapter "Using several WSM softwares in a network multi access function" on page 7.

Launching the WSM software

When you have connected the devices:

- Switch on all connected devices.
- To launch the WSM software:
- Double-click on the program icon on the desktop.

Or:

Click on "Start" > "Programs" > "Wireless Systems Manager". This launches the WSM software and the main window appears.

Setting the language



Click on "Language" and select the desired language.
 A tick appears in front of the selected language. The language of the software interface is changed.

Using several WSM softwares in a network – multi access function

The multi access function allows you to simultaneously network up to 6 computers with the Sennheiser devices. Configurable access rights establish clear procedures and hierarchies for your production.

You can install the WSM software on several computers in a network. For the individual application scenarios you can assign different rights for accessing the devices in the network (e.g. for the parameters):

- "Exclusive":
 - All access rights are assigned to only one WSM (see page 9).
 - The access rights cannot be shared with other WSMs.



WSM





- "Shared":
 - All WSMs have the same access rights (see page 9).
 - While one WSM is accessing a device (remotely), this device is locked for all other WSMs until this action is terminated.
- "Hands Over":
 - All access rights are assigned to only one WSM (see page 9).
 - However, the access rights can be shared with other WSMs.
- "Remote Disable" (no access rights):
 - The WSM has no access rights.
 - The WSM is solely used for monitoring.

Proceed as follows:

1. First define the access rights for only one WSM software (see the following chapter for details).

 Adapt the access rights of all other WSMs to the settings of the first one (see "Assigning access rights to additional WSMs" on page 9). Or:

Deny access for all other WSMs (see "Withdrawing access rights from a WSM" on page 10).

Assigning access rights to a WSM



Single remote machine	Password		
 Single remote machine 	 No password 	C Use password	
	Change password		
Auto discovery			
Disable auto discovery	Old password:		
Multiple machines	New password:		
 Exclusive (only this WSM instance has permanent access) 	Sontinnation:		
Shared (access as necessary)			

If the "Disable auto discovery" check box is activated, the WSM is prevented from causing unwanted network traffic. In this case, however, new devices in the network cannot be detected.

- Under "Multiple machines" select one of the options "Exclusive", "Shared" or "Hands Over".
- Click on "OK".

The WSM software obtains the selected access rights.

To be able to access the devices:

Click on "System" and check if the "Remote Access" command is ticked.

If "Remote Access" is not ticked:

Click on "Remote Access".

You may be requested to enter a password (see page 10). Enter the password if available or contact your system administrator. A tick appears to the left of the item and a red dot appears in the panels. You have access to the devices.

• If you have selected "Exclusive" or "Hands Over", red dots appear in the panels. These dots indicate that you have access to these devices.

٠		٦
_		
_	EM3732	_

 To protect the WSM software with a password, proceed as described in chapter "Protecting the WSM with a password" on page 10.

Sys	tem Language Channel
	Remote Access
	Refresh Device List
*	Online mode Offline mode
	Preferences
-	Dante Mapping
	Dante Audio Mode 🔹 🕨

*	Online mode Offline mode
	Preferences
	Dante Mapping
	Dante Audio Mode

tem Language Channel

Assigning access rights to additional WSMs

When using additional WSMs in a network, adapt their settings according to the previously selected access rights. If you do not want to assign any access right to a WSM software, just deactivate it (see "Withdrawing access rights from a WSM" on page 10).

Have you selected "Exclusive" for the first WSM?

In this case, the first WSM being registered in the network owns all access rights. In order to avoid any collisions, you should deactivate access to the devices for all other WSMs (see "Withdrawing access rights from a WSM" on page 10).



If you should assign "Exclusive" access right to several WSMs, then access is random. The WSM which registers quicker with the device owns all access rights. This can, under certain circumstances, lead to confusion during operation.

Have you selected "Shared" for the first WSM?

All WSMs with this access right are equal. While one WSM is accessing a device (remotely), this device is locked for all other WSMs until this action is terminated.

Select "Shared" for all other WSMs in the network that shall obtain access rights. Proceed as described in chapter "Assigning access rights to a WSM" on page 8.

Have you selected "Hands Over" for the first WSM?

First one WSM owns all access rights. However, the access rights can be requested by another WSM with "Hands Over" right. The WSM that owns the access rights receives a message and can then share the access rights with the other WSM.

Select "Hands Over" for all other WSMs in the network that are authorized to request access rights if required. Proceed as described in chapter "Assigning access rights to a WSM" on page 8.

To request the access rights:

Make the desired settings (e.g. parameters).

WSM transmits a message to the user of the WSM with the access rights. The user confirms the assignment of access rights. The parameter is transferred to the device.

2)	PC 'cdeel128' v	vants to get remot	e access to the (device EM3732-2	2. Do you want to
4	grant?				

Withdrawing access rights from a WSM

If you want to use a WSM exclusively for monitoring the system, you can withdraw the right to access the devices as follows:



Click on "System" and check if the "Remote Access" command is ticked.

If "Remote Access" is ticked:

Click on "Remote Access".

The tick disappears. The rights to access the devices are, thus, withdrawn.

Protecting the WSM with a password

To protect this WSM and its devices against manipulation, you can enter a password; proceed as follows:

Click on "System" > "Preferences". The "Preferences" window opens.

Sys	tem Language Channel
	Remote Access
	Refresh Device List
*	Online mode Offline mode
	Preferences
	Dante Mapping
1	Dante Audio Mode 🔹 🕨

Single remote machine	Password		
Single remote machine	No password	C Use password	
Auto discovery Disable auto discovery	Old pessword:		
Multiple machines Exclusive (only this WSM instance has permanent access) Shared (access as necessary) Handover (WSM1 grants WSM2 permanent access)	lew password:		

Select the "Use Password" radio button.

To set up a password:

- Enter your password in the "New Password" and "Confirmation" fields. The "Old Password" field remains empty.
- Click on "OK".

After this, the access rights can be modified only by users who know this password.

To change your password:

- Enter your old password in the "Old Password" field.
- Enter your new password in the "New Password" and "Confirmation" fields.
- Click on "OK". After this, the access rights can be modified only by users who know this password.
 - If you want to disable the password protection, click on the "No Password" radio button.
 - If you should have forgotten your password, please contact your local Sennheiser partner.

Registering a device with a static IP address

If you have assigned a device a static IP address, this device is not automatically detected by the WSM. You must manually register these devices with each WSM.



In the system window, click on the "Devices" tab. If the system window is not shown, click on "View" > "System window".

To register the device with a WSM:

Right-click a free area in the system window. A shortcut menu appears.

	System
Add device	

 Click on "Add device". The "Add device" window opens.



- Click on the desired device.
- In the "IP Address:" field, enter the static IP address.
- Click on "OK".

Registration of the device is now complete. The device is marked by a red cross in the system window. The device list is updated after a short time. A green tick appears in front of all detected devices.

- If the WSM cannot detect the device with the static IP address, check the settings of the device and of your network.
- To register additional devices, repeat the above steps.

Saving the configuration

To save the registered device with the static IP address:

Click on "File" > "Save Configuration" or "File" > "Save Configuration As...".



If you close the WSM without saving the configuration, you must register the devices with a static IP address again. These devices are not detected automatically.

The operator interface of WSM

This chapter describes the operator interface of the WSM software. You will become acquainted with the system setup and the individual menus.

Main window



The main window contains the following regions:

Menu bar
 Symbol bar (tool bar)
 Display area
 Status bar

Menu bar

File View Scenes System Language Channel Frequency Manager Applications Help

The menu bar \bigcirc is always visible.

You can select from the following menus (see page 15 and the following): "File", "View", "Scenes", "System", "Language", "Channel", "Frequency Manager", "Applications", "Help"

Symbol bar (tool bar)



You can operate the WSM via the menu bar ① and via the buttons in the symbol bar ②. The symbol bar can be shown or hidden ("View Menu" > "Tool Bar").

Display area



With the standard settings, the display area 3 is divided in two. The "panels" for the connected devices are displayed on the left; this region is designated as the scene.

The tabs of the system window are displayed on the right.

Scene

In a scene, you can set up and sort panels (see "Working with panels" on page 76). Each panel displays a channel or a connected device.

Master Scene Band 1 When you create a new configuration, there is first only the "Master Scene". For a better overview, you can set up additional scenes (see "Adding new scenes" on page 72). You can also copy panels, together with their panel settings, from one scene to another.

System window

The system window can be enlarged or reduced by dragging the border between the scene and the system window. By selecting the menu item "View" > "System Window", you can show or hide the system window.

Devices Tools Messages YO

You can toggle between the "Devices" (device list), "Tools" and "Messages" (message list) tabs.

"Devices" tab

The "Devices" tab displays a list of all connected devices.

If you click on the plus box "+" next to an entry, it will expand and display the channels of the device.

The devices connected to an EM 3732 or EM 3732 Command are displayed with the channel number (RX 1 / RX 2).

Display	Meaning
✓	Device is switched on.
×	Device is switched on or WSM is in "Offline" mode (see page 23).
	Device is indicated as a panel in the currently selected scene.

You can select one or several devices, drag these, as panels, in the current scene and change the device settings (see "Working with panels" on page 76).



"Tools" tab

The "Tool" tab has two icons that you can drag in the scene. In each case, a new window appears in the scene (see "Recording the field strength using the tools" on page 92):

"Spectrum Analyzer"

This tool and a stationary receiver allow you to check a defined frequency range for signals, to monitor these signals and to record the measured values.

"RF Level Recorder": This tool allows you to record the field strength over a defined period of time.

"Messages" tab

The "Messages" tab displays all messages of the devices. The messages appear in chronological order with their "Origin" and their "Severity".

System		e e e e e e e e e e e e e e e e e e e	3
Time	Origin	Severity 🔶	
08:42:43	System	INFO	
08:42:43	System	INFO	
08:42:41	System	INFO	
08:42:41	System	INFO	
08:42:41	Port 2 EM2050 0.000 MHz	INFO E	
08:42:41	Port 2 FW1.7.0 812.050 MHz	WARNING	
08:42:41	Port 2 EM2050 0.000 MHz	INFO	
08:42:40	System	INFO	
08:42:26	System	INFO	
08:42:24	System	INFO	II
08:42:24	System	INFO	
08:42:18	System	INFO -	
•	m	E.	
Devices	Tools Messages		1

Status bar

User cancels the device configuration wizard

13:57:39

The last message from the devices is displayed on the left in the status bar (4).

The current date and time are displayed on the right.



Overview of menus

The "File" menu

File	
New Configuration	
Open configuration	Ctrl+0
🗄 Save configuration	Ctrl+S
🔋 Save configuration As	
Print	Ctrl+P
👻 Save Message Log	
🐻 Clear Message Log	
Exit	

Menu item	Function of the menu item	Button
"New Configuration"	Creates a new configuration.	
"Open Configuration"	Opens a saved configuration.	
"Save Configuration"	Saves the current configuration under the same name.	H
"Save Configuration As"	Saves the current configuration under a new name.	H
"Print"	Prints the current configuration as graphic or text.	8
"Save Message Log…"	Saves the messages in the system window as a file ("Messages" tab).	F
"Clear Message Log"	Deletes the messages from the system window ("Messages" tab).	×.
"Exit"	Terminates the "WSM".	

The "View" menu

Vie	View		
~	System Window		
*	Tool Bar		
*	Show Grid		
4	Snap to Grid		
TTT I	Auto Arrange		

Menu item	Function of the menu item	Button
"System Window"	Shows or hides the system window.	
"Tool Bar"	Shows or hides the tool bar.	
"Show Grid"	Shows or hides the grid for aligning the panels.	
"Snap to grid"	Aligns the panels to the grid if you move the panels.	
"Auto Arrange"	Automatically arranges the panels side by side and one below the other, depending on the screen size.	

The "Scenes" menu

Menu item	Function of the menu item
"Add New Scene"	Creates a new scene.
"Rename Scene"	Changes the name of the selected scene.
"Copy Scene"	Copies the current scene.
"Paste Scene"	Pastes the current scene.
"Delete Scene"	Deletes the selected scene from the display. The configuration of the devices is retained.
"Select Scene"	Changes to a different scene.
"New Label"	Creates a comment field in the selected scene.

Rename scene	F2
Copy Scene/Select and C	lopy All
Paste	Ctrl+\
Select all channels	Ctrl+/
Delete scene	
Select Scene	

Sys	tem Language Channel
	Remote Access
	Refresh Device List
	Online mode
¥	Offline mode
	Preferences
	Dante Mapping
	Dante Audio Mode 🔹 🕨

The "System" menu

Manualtana	From stilling and the second theme	Dutters
Menu Item	Function of the menu item	Button
"Remote Access"	Activates or deactivates access to the parameter settings of the devices (see page 89).	
"Refresh Device List"	Updates (refreshes) the device list in the system window ("Devices" tab). New devices are displayed, previously moved or deleted panels are reposi- tioned in the display area.	
"Online Mode"	Enables operation of the connected devices (live operation).	
"Offline Mode"	Must be activated for the pre- configuration ("Device Configuration", see page 23). Device connections will be interrupted.	
"Preferences"	For setting the access rights of different WSM in a network and for activating password protection (see page 23).	
"Dante Mapping"	For manual mapping of the EM9046 receivers to their corresponding Dante modules (see page 85).	
"Dante Audio Mode"	Selects "Stereo" or "Mono" mode for live stream listening. In stereo mode, you can listen to up to four channels using WDM, to up to 32 channels using ASIO on Windows and to up to 32 chan- nels using a MAC. In "Mono" mode, the number of available channels is doubled (see page 88).	

The "Language" menu

Language	Menu item	Function of the menu item
 English (English) Deutsch (German) 	"English"	
Français (French)	"Deutsch"	Changes the language of the software interface.
	"Français"	

The "Channel" menu

The following menu items can vary and depend on whether you have selected one panel or several panels.

Menu item	Function of the menu item
"Channel Sorting"	Sorts the sequence of panels in a scene according to user default (for EM 3732-II and stationary devices of the ew G3 and 2000 series; see page 80).
"Properties" / "Common Proper- ties"	Displays the parameters of the selected device or the common properties of the selected devices.
lcon"	Displays a submenu with a selection list of different icons and numbers (see page 79). Pictures can also be used.
"New Label"	Creates a label for comments on the selected panel (see page 82).
"Identify Channel"	Displays the device belonging to the panel (for EM 3732-II and stationary devices of the ew G3 and 2000 series; see page 81).
"View Style"	Displays a submenu with a selection list of three different graphical representations for the "receiver" panels (see page 77).
"Panel Color"	Assigns a color to the border of the panel (see page 79).
"Use Panel Settings As Default"	Saves settings such as panel style, size, icon or number and color of the selected panel. These standard panel settings can be applied to other panels (see page 79).
"Use Default Panel Settings"	Applies the last saved standard panel settings to the selected panel (see page 79).
"Сору"	Copies the selected panel to the clipboard (see page 80).
"Remove/Cut"	Deletes the selected panel from the display area. The panel can be pasted to another scene. The settings of the panel and the device settings are retained (see page 80).
"Paste"	Copies the panel from the clipboard to the selected scene (see page 80).

The "Frequency Manager" menu

	Display	Function of the menu item
	"Easy Setup"	Detects and allocates unused frequencies to the system (see page 33).
	"Professional Setup"	Detects and allocates unused frequencies to the system (see page 41).



Frequency Manager

Professional Setup Ctrl+F

Ctrl+E



Help Help Abr

The "Applications" menu

Menu item	Function of the menu item	Button
"Device configura- tion"	Device pre-configuration in offline mode (see page 23).	
"Stationary Devices"	Allows to define, add and export new frequency ranges for existing stationary devices (see page 38).	
"Firmware Update"	Starts the firmware update (see page 29).	
"Dante Firmware Update"	Starts the firmware update for Dante modules (see page 32).	
"RF Level Recorder"	Monitors the field strength of a receiver's diversity channels over a defined period of time and records the measured values (see page 94).	14
"Spectrum Analyzer"	Checks a defined frequency range for signals; monitors these signals and records the measured values using a stationary receiver (see page 92).	al.

The "Help" menu

	Menu item	Function of the menu item	Button
F1 ut	"Help"	Opens a window in which the online help is displayed.	?
	"About"	Opens a window in which the version number is displayed.	

Layout of the panel

Every panel displays a stationary device. The graphical representation of the panel depends on the device type and the settings made under "View Style" in the "Channel" menu. For details on the possible settings, see "Working with panels" on page 76.

The following screenshot shows an example panel:



A red dot in the panel indicates that you have access rights for these devices (see "Using several WSM softwares in a network – multi access function" on page 7).

Icon



The top left corner of the panel can be provided with an icon, a number or a picture (see "Selecting an icon for a panel" on page 78).

Depending on the connected device, one of the following icons appears:

lcon	Peculiarity	Meaning
Lights up	EM 373X receivers only	An external word clock generator is connected and switched on.
flashes		The receiver is not synchronized with the word clock generator (see instruction manual of the device).
		The receiver is working with the internal word clock generator.
	ew G3 series	No display appears.

lcon	Peculiarity	Meaning
A	EM 9046 receivers only	Streaming is not enabled (for information on how to enable streaming, see page 84).
R		Streaming is enabled but no stream is played. The letter R indicates that RTP/RTSP streaming is used. RTP/RTSP streaming is active and streams can be listened to.
		Dante streaming is enabled but no stream is played. Dante streaming is enabled and streams can be listened to.

2 Name of the device

The name set on the device is displayed. The name can be changed in the "Properties" window (see page 89).

3 Frequency and channel display



Name

The frequency of the device appears below its name. The channel is displayed below the frequency (see ""Easy Setup" frequency management" on page 33 and "Working with panels" on page 76).

4 Diversity display



The active antenna is displayed in green.

The labeling of the diversity sections depends on the device type:

- 3000 series receivers: "A" and "B"
- ew G3 and 2000 series receivers: "I" and "II"

5 Field strength display (RF)



The bar graphs indicate the current field strength. The horizontal yellow line indicates the set squelch threshold (see "Working with panels" on page 76).

If the field strength is below the squelch threshold, the bar appears in red and the audio output is muted.

6 Status field / Display of the audio outputs AF and COM



If a threshold value on the device is exceeded or undershot, a message appears in the status field.

The messages are highlighted in different colors. The part of the panel to which the message refers is also highlighted.

Display	Color	Meaning of the message
MUTE	yellow	The device is muted.
PEAK	red	The device is overmodulated.
LOW BATT	red	The device's battery is almost flat.
LOW RF	red	The squelch threshold is almost reached.

The message also appears in the system window ("Messages" tab) and in the status bar.

AF COM

With the EM 3732 Command twin receiver, the status field appears in alternation with the current status of the audio and command outputs (see EM 373X instruction manual):

Display	Audio output	is
AF COM	AF out	switched on
	Command	switched on
AF COM	AF out	switched off
	Command	switched on
AF COM	AF out	switched on
	Command	switched off
AF COM	AF out	switched off
	Command	switched off

Modulation display (Deviation/AF)

Level indicator for the audio level at the transmitter.

The threshold values are displayed in color in the modulation display. A yellow section in the bar graph indicates that the transmitter is fully modulated. An additional red section indicates overmodulation. If this occurs, reduce the modulation level on the transmitter.

The modulation displays depend on the device type:

- 3000 series receivers: "Dev"
- ew G3 and 2000 series receivers and stationary transmitters: "AF"

With these receivers, the modulation can be shown in different views (see "Changing the graphical representation of panels" on page 77):

- "Variant" 1 and 3: The modulation is shown as a bar graph.
- "Variant" 2: The modulation is shown as a colored box. The display changes between three colors, depending on the state.

8 Battery status



The battery symbol indicates the charge status of the batteries. The graphical representation depends on the device and battery type (primary cells or accupack).



Color	Meaning
green	The battery is fully charged.
yellow	The battery is about half discharged.
red	The critical level is reached. The battery symbol flashes red. Additionally, a message appears in the panel, the system window ("Messages" tab) and the status bar.

The remaining accupack capacity is additionally displayed for ew G3 and 2000 series devices.

Configuring the system in Offline Mode



The WSM allows you to configure your wireless system in Offline Mode where and whenever you want. The set parameters can directly be transferred to your Sennheiser devices before the show. This helps you to save valuable set-up time at the production venue.

Creating a new configuration

Changing to Offline Mode

Click on "System" > "Offline Mode".

If devices are connected, the link is interrupted. The corresponding panels will be highlighted in gray. The devices in the "Devices" tab of the system window are marked with a red "x".

 Click on "Applications" > "Device configuration". The following window opens.

wish to load a configuration from a file.	ect the devices to be configured and move to the Configurable devices section. Click Ad	a from file' if you
evices	Configurable devices	
M3731 IM3732 IM3732 IM3732com IM3732com IM3732com-II IM9046 IM300 G3 IM2000 IM2050 IM2050 IM2050 IM2050 IEM G3 ISR2000 IEM IEM		
	Delete Add from	file

	Refresh Device List	
	Online mode	
¥	Offline mode	
	Preferences	
	Dante Mapping	
	Dante Audio Mode	

System Language Channel

Applications				
킨	Device configuration	Ctrl+D		
	Stationary Devices	F.		
	Firmware Update	Ctrl+U		
	Dante Firmware Update			
*	RF Level Recorder	Ctrl+L		
H	Spectrum Analyzer	Ctrl+M		

Adding devices to the list

The window contains two lists. The left-hand list displays all WSM compatible devices. The right-hand list displays your current device selection.

To add devices to the list:

- In the left-hand list, click on a receiver or a transmitter (IEM).
- Click on ">>".

The selected receiver or transmitter (IEM) appears in the right-hand list and is included in the system. Add any number of devices to your system.

 Click on "Next >". The following window appears.

Loading a list

If you wish to change an existing list, you can load this list ("Add from file...") and then add devices to or delete devices from the list.

Devices which occupy two ports are displayed twice.

ew G3/2000 series	EM 3732/EM 3732 Command	EM 9046
• RX 1	• RX 1	• 1
• RX 2	• RX 2	• 2
		• 3
		• 4
		• 5
		• 6
		• 7
		• 8

	Device configuration	
evice allocation The selected devices are When all devices are in t	automatically allocated to device. The position of the devices within t e correct position, press "Next" to continue.	the list can be changed using drag & drop only for Net1 devic
Device	Port	^
EM3731(1)		
EM3731	Rx1	
EM3731-II(2)		
EM3731	Rx1	
EM3732(3)		
EM3732	Rx1	
EM3732	Rx2	
EM3732-II(4)		
EM3732	Rx1	
EM3732	Rx2	
EM3732com(5)		
EM3732	Rx1	
EM3732	Rx2	
4 EM3732com-II(6)		
EM3732	Rx1	
EM3732	Rx2	
EM9046(7)		
EM9046	1	
	2	
	3	
	4	
	5	
	7	
	8	
4 EM300 G3(8)	0	
EM300G3	Px1	
4 EM500 G3(9)	10x1	
EM500G3	Bx1	
EM2000(10)		
EM2000	Rx1	
EM2050(11)		
EMODED	Dvd	Ŷ
		< Back Next > Cance

To assign a receiver or transmitter (IEM) to a different device or port:

- Click on the receiver or transmitter (IEM).
- Keep the mouse button pressed and drag your selection to the desired port.

The receiver or transmitter (IEM) appears in the corresponding position in the list.

After you have assigned all receivers or transmitters (IEM), click on "Next >".

The following window appears.

Pre-configuring device parameters

onfigurable device:	5	Property settings: Check the p	properties to be downloaded Value	^	
EM3731 EM3731-II(2) EM3731-II(2) EM3732(3) EM3732(3) EM3732(3) EM3732(1) EM3732	470.000 MHz EM3731 470.000 MHz EM3731 470.000 MHz EM3731 470.000 MHz EM3732 516.000 MHz EM300G 516.000 MHz EM500G 516.000 MHz EM2000	Frequency range Name Bank Channel Frequency Squelch Display AF out Lock mode Booster feed Clock Frequency list Bank U Channel 1 Channel 3 Channel 4	L (470 - 638 MHz) EM3731 1 1 470.000 0 Name -10 Off Off 44.1 470.000 470.000 470.000 470.000	• MHz • MHz • μV • dB • kHz • MHz • MHz	Import frequency list Save Copy properties Paste properties Copy/Paste is possible with kundov standard method (multi-selection with CTRL+Ieff mouse button, Shift-Haft-mouse button, CTRL+VApple+Vbuttons). Copy / cTRL+VApple-Vbuttons). Copy
EM2050 EM2050 4 SB300 JEM G3(12)	516.000 MHz EM2050 516.000 MHz EM2050	Channel 6	470.000	MHz V	copied to the clipboard and the target device is of the same device type.

Changing device parameters

In the left-hand list, click on a device.

The "Property settings" list displays the device parameters.

The parameters displayed depend on the type of the device.

The left-hand column (Name) displays the device parameters. The two columns on the right of it display the corresponding values (Value) and units (Unit).

- If you are changing the settings for the "Frequency", "Bank" and "Channel", the "Frequency" setting is prior-ranking. The bank and channel are selected according to the selected frequency.
 - Specific information on the parameters can be found in the instruction manuals for the devices.
 - The settings of individual devices can also be changed later when the devices are already connected (see "Changing the parameters of a device" on page 91).

Value	
BACKGROUND	
U	•
1	
848.375	A. T
830.000	
866.000	
Name	•
0.	-
Mono	*
Off	-

- Click on the entry field or on the arrow next to the corresponding parameter.
 - A flashing cursor or a selection list appears.
- > Enter the desired value or select a value from the selection list.



Make sure that the device type and the frequency range match. Information on the frequency range is given on the type plate.

Copying parameters and pasting them to other devices

- Click on the device whose parameters you want to copy.
- Click on "Copy Properties" to copy the parameters.
- Click on the device to which you want to assign the copied parameters.
- Click on "Paste Properties" to paste the copied parameters to the device.

Saving parameters

- Click on "Save".
 - The "Save File" dialog box appears.
- Select the folder in which you want to save the file.
- In the dialog box, enter a name for the "wsm" file.
- Click on "Save".
 - The data is saved. The dialog box closes.

After you have set all parameters

- Click on "Finish".
 - The dialog box closes.

In the "Device" tab of the system window, the configured devices appear. To the left of them a red "x" is shown.

Transferring the configuration to the devices



System

- Connect the devices.
- Switch on all devices.



To change to Online mode:

Click on "System" > "Online mode". The following window appears.



You can use either the parameters from the offline configuration or the device parameters.

If you want to use the device parameters:

Click on "Load device settings to WSM". The WSM takes over the device parameters. The offline configuration is not used in this case.

If you want to transfer the set parameters from the offline configuration:

Click on "Match configuration to devices"

The connected devices are searched. The following window appears.

Varning: You will overwrite d	evice parameters with your c	onfiguration when y	ou finish th	e dialog(
The position of devices conne Configured:	cted to a NET1 device can be	changed by drag a	nd drop,	Actual:	devices can be	changed	by dra	ig & drop,	
Device type	Frequency	Name	^	Device type	Frequency	Name	Port	Frequency range	
EM3732-2				-		-		-	
EM3732	678.000 MHz	027		4 FM3732-F-2					
EM3732	679.675 MHz	028		EM3732	678 000 MH-	027	Ry1	E : 678 000 - 768 000 MH-	
EM3731-3				EN12722	670 675 MILL	020	Duc	E . 670 000 760 000 MHZ	
EM3731	710.250 MHz	3731	100	EIVID/D2	0/9.0/5 MHZ	020	KX2	E : 070.000 - 700.000 MHZ	
EM2050-4				EM3731-II-N-3					
EM2050	0.000 MHz	EM2050		EM3731	710.250 MHz	3731	Rx1	614.000 - 798.000 MHz	
EM2050	592.000 MHz	009		EM2050-Gw-4					
EM2050-5				EM2050	0.000 MHz	EM2050	Rx1	0.000 - 0.000 MHz	- 1
EM2050	791,500 MHz	014		EM2050	592 000 MH7	009	Ry2	Gw : 558 000 - 626 000 MHz	
EM2050	792.475 MHz	015		4 EM2050 Day 5	352.000 WINZ	003	nu2	5W - 550,000 - 020,000 MITZ	
4 EM2000-6				- EM2050-DW-5			-		
EM2000	791.075 MHz	013		EM2050	791.500 MHz	014	Rx1	Dw : 790,000 - 865,000 MHz	
SR2050 IEM-7				EM2050	792.475 MHz	015	Rx2	Dw: 790.000 - 865.000 MHz	
SR2050 IEM	604.225 MHz	010		4 EM2000-Dw-6					
SR2050 IEM	0.000 MHz	SR2050		EM2000	791.075 MHz	013	Rx1	Dw: 790.000 - 865.000 MHz	
SR2050 IEM-8			~	4 SB2050 IEM-Gw-7	1000 C	ardia		and the second states	
<			>	SP2050 IEM	604 225 MH-	010	Tv1	Gw : 558 000 - 626 000 MHz	
and the second se				SK2030 IEM	004,223 10112	010	IXI	GW - 556.000 - 620.000 Miliz	
Comparison result:								Refresh device	e List
EM3732-2 - Matched with: EM3	732-E-2							and the second states of the	
- EM3732: 027 Rx	1 - Matched with EM3732: 027 R	x1							_
- FM3732: 028 Rv	2 - Matched with FM3732 028 R	x2							
EM3731-3 - Matched with EM23	731-II-N-3								
ENGINE MALCHEU WILLE ENGI	Matched with EMOTON 2724	Dut							
- EM3/31: 3/31 H	or - Matched with EM3/31: 3/31	RXI							
EM2050-4 - Matched with: EM20	J50-GW-4								
- EM2050: EM205	60 Rx1 - No matching device four	d							
- EM2050: 009 Rx	2 - Matched with EM2050 : 009 F	x2 - Your channel con	figuration de	pes not fit with the device of	thannel bank. P	lease check	the ch	annel after matching	
EM2050-5 - Matched with: EM20	050-Dw-5								- 8
- EM2050: 014 Rx	1 - Matched with EM2050 : 014 P	x1 - Your channel con	figuration de	ses not fit with the device of	thannel bank. P	ease check	the ch	annel after matching	
- EM2050-015 P	2 - Matched with EM2050 - 015 E	v2 - Your channel com	figuration de	bes not fit with the device	thannel hank p	ease check	the ch	annel after matching	
EM2000-6 - Matched with: FM22	DOD-Dure	and their charmer con	inguination ut	as the fit with the device t	that the match of P	CARE CHECK	sine chi	anne arter matering	
EW2000-6 - Matched with: EM20	00-DM-0	a find the second		and the second second	2	14.10.0	Sec. 7	the second s	
- EM2000: 013 Rx	1 - Matched with EM2000 : 013 F	x1 - Your channel con	figuration de	bes not fit with the device o	channel bank. P	lease check	the ch	annel after matching	

The left-hand list displays the pre-configured devices ("Offline Configuration"). The right-hand list displays all currently connected devices. The device assignment appears in the "Comparison result" window.

The assigned devices are highlighted in the list on the left.

Color	Meaning
green	Configuration matches the connected device.
orange	Channel bank of the device does not match the configuration. A manual check of the device is necessary.
red	No suitable device found (e.g. differing frequency range).
black	Device found on a different port and assigned automatically.

If devices are marked black or red, you can:

- re-connect the receivers according to the configuration,
- change the configuration ("< Back")

To connect the devices according to the configuration:

- Connect all devices marked black to the corresponding ports.
- Click on "Refresh Device List" to update the list.

Updating the firmware of the devices

The "Wireless Systems Manager" allows you to update the firmware of the connected Sennheiser devices.

Displaying the firmware versions of the devices

You can display the firmware versions of the connected devices.

Example EM 3732:

Frequency range	:S	EM373x MAC address
Left tuner:	678 - 768 MHz	
Right tuner:	678 - 768 MHz	00:1b:66:00:00:93
Service ID Device:	2.2.0.0.5.1.2.617e200.2	202000.61fe200.2020000.7.31.206.206
Service ID Device:	2.2.0.0.5.1.2.617e200.2	2020000.61fe200.2020000.7.31.206.206
Service ID Device:	2.2.0.0.5.1.2.617e200.: IP address:	2020000.61fe200.2020000.7.31.206.206 169.254.90.229

Display	Meaning
Frequency ranges	Displays the left tuner and right tuner frequency range
MAC address	Displays the MAC address of the device
Service ID	Displays the service ID of the device
IP address	Displays the IP address of the device

Click on "OK".

The dialog box closes.

Downloading the latest firmware update from the Internet

Sennheiser is continuously improving the WSM software. We therefore recommend that you register on our website at www.sennheiser.com. You can then regularly receive a newsletter providing information on the WSM and the latest firmware versions.



- Select the current firmware package (SENNPKG file) on the Sennheiser website at www.sennheiser.com and start the download.
- Click on "Open".

The file is automatically saved in the "New Releases" subfolder of the program folder. If this folder already contains a file, this file is moved to the "Archive" folder.



Preparing the firmware update

Only the firmware is updated, the device settings remain the same.

Devices that are marked with a "U" in the "Devices" tab of the system window have an outdated firmware that must be updated.

To prepare the firmware update:

- Switch on all receivers and transmitters. Switched-off devices will be ignored during update.
- Click on "Applications" > "Firmware Update". The "Firmware Update" window opens.

Firmware package		
The default firmware package is:		
The selected firmware package is:		
		Choose

If there is a new firmware version available in the "New Releases" folder of the program folder, it is displayed in the "The selected firmware package is:" field.

You can select a firmware package (SENNPKG file) for your Sennheiser devices.

To use the firmware version from the "New Releases" folder:

Click on "Next >". The connection to the devices is checked.

To use another version:

Click on "Choose...".
 A dialog box appears.

Ap	plications	
킨	Device configuration Stationary Devices	Ctrl+D
	Firmware Update Dante Firmware Update	Ctrl+U
* =	RF Level Recorder Spectrum Analyzer	Ctrl+L Ctrl+M

- Select the desired SENNPKG file and confirm by clicking on "OK". The dialog box closes.
- Click on "Next >".
- The connection to the devices is checked.



The "Firmware package" box on the right displays all available firmware versions from the selected SENNPKG file. The "Connected devices" box on the left displays the corresponding connected devices.

Devices with an older firmware version are automatically ticked.

To not update the firmware in a device:

In the "Connected devices" window, click on the check box of the device. The tick is removed. The firmware is not updated.

If you want to transmit an older firmware version to a device:

- Click on the "Allow downgrade" check box. A tick appears.
- In the left column, click on the check box of the device. A tick appears. The older firmware version will be transmitted to the devices during firmware update.
- Portable Sennheiser transmitters (see page 4) can be updated via their associated receivers (via the infrared interface).

CAUTION! Risk of data loss if transfer is interrupted during firmware update!



Data may be lost if the transfer is interrupted. The devices may also be damaged as a result.

- When updating the firmware, do not interrupt any device connection to the stationary devices.
- Do not disconnect power from the devices. Preferably use fully charged batteries for the portable devices!
- Since the updating process takes about 40 seconds, firmly position the portable devices in front of the infrared interface.

To start the firmware update:

- Click on "Start".
- Follow the instructions of the wizard.

Dante firmware update

The Dante firmware is updated using the "AVS Firmware Updater". The "AVS Firmware Updater" is provided by AuviTran (www.auvitran.com) and must be installed on your computer in order to update the Dante firmware.

Click on "Applications" > "Dante Firmware Update".

If the "AVS Firmware Updater" is installed, it is launched and the Dante firmware is updated.



If the "AVS Firmware Updater" is not installed, the following warning is displayed:



For detailed information on updating the Dante firmware, please visit the "Downloads" area on the AuviTran website.

Frequency management

There are two types of frequency management:

- "Easy Setup" frequency management allows to coordinate unused frequencies for small multi-channel systems and to allocate the frequencies to the devices.
- "Professional Setup" frequency management allows to coordinate unused frequencies for large multi-channel systems and to allocate the frequencies to the devices.

Easy Setup (see page 33)	Professional Setup (see page 41)
You can use "Easy Setup" for an ad-hoc on-site installation in online mode.	You can use "Professional Setup" for an ad-hoc on-site installation in online mode and for planning an installation in offline mode. In both cases, licenses, licensable areas and legal regulations can be taken into account in the coordi- nation.
 "Easy Setup" can be performed with or without a frequency preset scan. During the frequency preset scan the factory preset frequencies (presets) and the frequencies stored in the channel bank "U" of the selected receiver are checked 	 "Professional Setup" can be performed with or without a frequency scan. During the frequency scan the complete spectrum of the selected frequency range is checked.

"Easy Setup" frequency management

Individual device parameters can also be configured after "Easy Setup" (see "Working with panels" on page 76).

Launching the "Easy Setup" frequency management

> Deactivate the RF signal (RF Mute) of all portable transmitters for which you want to find unused frequencies.



1

The WSM automatically deactivates the RF signal of connected stationary transmitters.

- Switch on all possible sources of interference (e.g. light sources, video walls) and all other transmission links.
- Click on "Frequency Manager" > "Easy Setup".
- Follow the instructions of the wizard.



"Easy Setup" with or without frequency preset scan

You can allocate unused frequencies in various ways:



- "Preset Scan with portable receiver (EK IEM)": To find occupied as well as unused frequencies in the current vicinity of the system, perform a frequency preset scan.
- "Continue without Scan": To allocate already known unused frequencies to stationary devices, specify these frequencies without a frequency preset scan.

You can then allocate these unused frequencies to the portable devices.

Performing a frequency preset scan for monitoring systems

When operating both monitoring and microphone systems via the WSM, you first have to perform the frequency preset scan for the monitoring system.

The frequency preset scan is always performed for all frequencies in the selected channel bank.



The stationary transmitters of the corresponding frequency range are automatically switched off during the frequency preset scan.

Performing a frequency preset scan using a portable receiver

The frequency preset scan is performed using a portable receiver. You then transfer the scan results to the associated stationary transmitter. The WSM retrieves the data from the transmitter.

-			
SR-300G3	780.000 - 822.000 MHz	SR300 IEM G3-D-3/1	Please perform a scan with an EK IEM device. Then hold the device in front of the IR port of the NET1/ewG3 SR device.
			device. Then hald the device in front of the IR port of the NET1/ewG3 SR device.

- Before starting the frequency preset scan, switch off all portable transmitters of your system. Otherwise, frequencies used by switched-on transmitters will not be displayed as "unused".
- Start the frequency preset scan on the receiver (see the instruction manual of the receiver).

Allocating frequencies to stationary transmitters

You can allocate frequencies automatically or manually.

R-300G3 : 780.000 - 822.000 MHz	Transmitters
 Bank 4 Ch1 792.050 MHz Ch2 795.825 MHz Ch3 796.950 MHz Ch4 802.425 MHz Ch5 804.250 MHz Ch5 810.425 MHz Ch6 810.425 MHz Ch7 811.250 MHz Ch8 813.500 MHz Ch8 813.500 MHz Ch10 793.325 MHz Ch11 811.825 MHz Ch12 813.900 MHz Ch13 798.600 MHz 	SR-300G3 790.100 MHz SR-300G3 792.175 MHz

• Automatic allocation:

If you have connected more transmitters (IEM) from one frequency range than free channels are available in one channel bank, the RF signals of the surplus transmitters (IEM) are muted.

 Manual allocation: If you assign the same frequency to several transmitters (IEM), only the first transmitter with this frequency is transmitting. The RF signals of the surplus transmitters are muted.
Allocating frequencies for a monitoring system without a frequency preset scan

Allocating frequencies to stationary transmitters

You can allocate frequencies automatically or manually.

R-300G3 : 780.000 - 822.000 MHz	Transmitters
 Bank 4 Ch1 792.050 MHz Ch2 795.825 MHz Ch3 796.950 MHz Ch4 802.425 MHz Ch5 804.250 MHz Ch6 810.425 MHz Ch6 811.425 MHz Ch8 813.500 MHz Ch9 790.100 MHz Ch10 793.325 MHz Ch11 811.825 MHz Ch12 813.900 MHz Ch13 798.600 MHz 	SR-300G3 790.100 MHz SR-300G3 792.175 MHz

• Automatic allocation:

If you have connected more transmitters (IEM) from one frequency range than free channels are available in one channel bank, the RF signals of the surplus transmitters (IEM) are muted.

• Manual allocation: If you assign the same frequency to several transmitters (IEM), only the first transmitter with this frequency is transmitting. The RF signals of the surplus transmitters are muted.

Performing a frequency preset scan for microphone systems

When operating both monitoring and microphone systems via the WSM, you first have to perform the frequency preset scan for the monitoring system.

The frequency preset scan is always performed for all frequencies in the selected channel bank.

Allocating frequencies to stationary receivers

You can allocate frequencies automatically or manually.

R-300G3 : 780	.000 - 822.000 MHz	Transmitters	
Bank 1		SR-300G3 780.125 MHz	
Ch1	780.125 MHz		
Ch2	780.500 MHz		
Ch3	781.125 MHz		
Ch4	782.375 MHz		
Ch5	782.875 MHz		
Ch6	784.000 MHz		
Ch7	786.000 MHz		
Ch8	789.375 MHz		
Ch9	790.250 MHz		
Ch10	792.375 MHz		
Ch11	797.375 MHz		
Ch12	801.125 MHz		
Ch13	802.625 MHz		
Ch14	805.125 MHz		
Ch15	805.875 MHz		

• Automatic allocation:

If you have connected more receivers from one frequency range than free channels are available in one channel bank, the WSM re-assigns the last frequency assigned several times.

• Manual allocation: You can assign the same frequency to several receivers.

Allocating frequencies for a microphone system without a frequency preset scan

When you allocate frequencies without a frequency preset scan, interference with transmitters in the vicinity of the system may result.

Allocating frequencies to stationary receivers

Easy Steup Allocate frequencies to the transmitters: Either manually drag and drop the frequency from the frequency list to the transmitter in the transmitter list or select the "Automatic allocation" option and click "Finish". SR-300G3 : 780.000 - 822.000 MHz Transmitters SR-300G3 780.125 MHz ▲ Bank1 Ch1 Ch2 780.125 MHz 780.500 MHz Ch3 Ch4 781.125 MHz 782.375 MHz Ch5 782,875 MHz Ch6 784.000 MHz Ch7 786,000 MHz Ch8 789.375 MHz Ch9 790,250 MHz Ch10 792.375 MHz Ch11 797.375 MHz Ch12 801.125 MHz 802.625 MHz Ch13 805.125 MHz 805.875 MHz Ch14 Ch15 Allocate automatically < Back Finish Cancel

You can allocate frequencies automatically or manually.

• Automatic allocation:

If you have connected more receivers from one frequency range than free channels are available in one channel bank, the WSM re-assigns the last frequency assigned several times.

• Manual allocation: You can assign the same frequency to several receivers.

Defining, adding and exporting new frequency ranges for stationary devices



The "Stationary Devices" menu item in the "Application" menu allows you to define, add and export new frequency ranges for existing stationary devices.

The new frequency ranges are saved, together with the data of the frequency range definition file (xml file) supplied with the WSM, as a new file under a new file name. This new frequency range definition file can be edited, imported and exported.

Using the commands "Generate configuration file"; "Import configuration file" and "Export configuration file", you can create a new frequency range definition file and import or export a frequency range definition file.

Creating a new frequency range definition file

Click on "Stationary Devices" > "Generate configuration file". The "Add device properties" window opens.

Use default	definition file		
ramData/Senni	neiser/Wireless System	ns Manager/DeviceDefinitionFile/DeviceDefinition.xml	Browse input file
ramData/Senn)	neiser/Wireless System	ns Manager/DeviceDefinitionFile/DeviceDefinition.xml	Browse output file
3		4 6	
evice Type; R	eceivers	✓ Devices: EM 3731/3732	Add
EM 3731/3	732 Receivers	AA (520 - 640) 25	

Click on "Browse input file" 1.
 The "Select source device definition file" window opens.

	Select source device d	efinition file				3
🕀 🕘 – 🕇 📕 « W	/ireless Systems Manager → DeviceDefinitionFile	v c	Search Device	Definition	File	,o
Organize - New fold	ler			• 35		0
🔶 Favorites	Name	Date modified	Туре	Size		
E Desktop	DefaultDeviceDefinition	30-06-14 12:20 PM	XML Document		10 KB	
📕 Downloads	(a) new1	30-07-14 12:23 PM	XML Document		18 KB	
J Music						
Videos						
Videos						
Videos Computer DT-OS (C:)						
Computer DT-OS (C:) Intel File r	jame: new1		v Devices Defir	nition files	(*.xml)	*

- Select the frequency range definition file.
- Click on "Browse output file" 2.
- The file selection window opens.
- Select a folder and enter a name for the frequency range definition file you want to create.
- From the "Device type" drop down list 3, select the desired device type (e.g. "Receivers" or "Transmitters").
- From the "Devices" drop down list 4, select the desired device (e.g. EM 9046).
- Click on "Add" 5 to define a new frequency range for the selected device.

The following dialog opens:

Add device properties	? ×
0 0	
Min, Frequency: 0,000 🖨 MHz Max, Frequency: 0,000	MHz
Search Step: 25 😫 kHz	
reg - Max Freg) MHz	
OK Ca	ncel
	Add device properties

- ▶ In the "Frequency suffix" field ①, enter an alphanumeric value.
- Enter the minimum frequency of the new frequency range in the "Min. frequency" field 2.
- Enter the maximum frequency of the new frequency range in the "Max. frequency" field ③.
- Select the desired search step from the "Search step" drop down list ④.
- The default (and minimum) search step is 25 kHz. The search step can be incremented in multiples of 25.

The "Frequency string" (5) displays all the values entered in the fields.

Click on "OK".

The newly defined frequency range is added to the list area **6** of the "Add device properties" window.



The "OK" button is only enabled when all fields are valid.

You can delete newly added frequency ranges from the list area ĭ 6 by clicking on "Delete" 7.

If the "Select default definition file" check box (8) is activated, i the default frequency range definition file is loaded.

	Add device properties	?
Use default definition file		
gramData/Sennheiser/Wireless Syster	ns Manager/DeviceDefinitionFile/DeviceDefinition.xml	Browse input file
ıramData/Sennheiser/Wireless Syster	ns Manager/DeviceDefinitionFile/DeviceDefinition.xml	Browse output file
Device Type: Receivers	▼ Devices: EM 3731/3732 ▼	Add
Device Device type EM 3731/3732 Receivers	Frequency range Search step Transmis AA (520 - 640) 25	sion technology
Delete		_
		the second se

▶ In the "Add device properties" window, click on "OK". The new frequency ranges are added to the frequency range definition file.



You can define frequency ranges for all eight booster ranges of an EM 9046 receiver.

		Add dev	ice proper	ties					?	>
Receivers (EM 904	6)									
Frequency Prefix:	1	Min. Frequency:	0.000	-	MHz		Max. Frequency:	0.000	-	MHz
		Search Step:	25	-	kHz					
Frequency string:	Format: A (Min Freq -	Max Freq) MHz								
	Name	Prefix	Min. fre	quency	Max. fre	quency				
	Booster range 1		0.00	\$	0.00	-				
	Booster range 2		0.00	\$	0.00	-				
	Booster range 3		0.00	\$	0.00	\$				
	Booster range 4		0.00	\$	0.00	\$				
	Booster range 5		0.00	-	0.00	\$				
	Booster range 6		0.00	\$	0.00	-				
	Booster range 7		0.00	\$	0.00	-				
	Booster range 8		0.00	\$	0.00	\$				
							OK	0	ance	1

If the selected device is a transmitter, the "Add device i properties" window contains an additional drop down list called "Transmission technology", from which you can select the transmission technology to be used.



Importing a frequency range definition file

To import an frequency range definition file (xml file):

- Click on "Stationary Devices" > "Import configuration file". The file selection window opens.
- Select the desired frequency range definition file and click on "OK". The frequency range definition file is imported and its frequency ranges are available for use.

Exporting a frequency range definition file

To export an frequency range definition file (xml file):

- Click on "Stationary Devices" > "Export configuration file". The "Save device configuration file" window opens.
- Select a folder and enter a name for the frequency range definition file you want to export.

"Professional Setup" frequency management

For information on the differences between "Easy Setup" and "Professional Setup", refer to the chapter "Frequency management" on page 33.

Launching the "Professional Setup" frequency management

Deactivate the RF signal (RF Mute) of all portable transmitters for which you want to find unused frequencies.



The WSM automatically deactivates the RF signal of connected stationary transmitters.

- Switch on all possible sources of interference (e.g. light sources, video walls) and all other transmission links.
- Click on "Frequency Manager" > "Professional Setup". The "Professional Setup" window opens.
 - The following gives an overview of the tabs and setting possibilities of the "Professional Setup" window.

Information on the regional frequency grid, on performing/ importing a frequency scan and on analyzing the frequency spectrum can be found in the chapter "Loading the regional frequency grid, performing a frequency scan and analyzing the frequency spectrum" on page 68.

Frequency Manager	
<u>E</u> asy Setup	Ctrl+E
Professional Setup	Ctrl+F

Overview of the "Professional Setup" window

Devices	System	regions Freque	uncies/Dands Sp	are groups Coordination [0]	Allocation	Harkers L	og messages				
2 Scan		Channel name	Stationary device	Frequency range	Frequency	Portable device	Spare frequencies				
-	_	_			_						
3 Add deve	es Bercon										
	0,0		x								6 Device fitters (all)
4			_								
dên 🔹						No. of Concession, Name		VIII T. IDS IIII	v. 1200		9
6											System item filters (al)
-70											
-44											8 Freq., Swind filters (all)
- 110											2
-10		80 520 546	240 120	100 1-21 1-41 946	500 700	720 742	751 752 8	07 142 14		701 321	
							and income and it is the	Se 1: Brown Plantin		atterned Record Decar	Particular State

Ele	ment	Function
0	Tabs: Devices", "System regions", etc.	For detailed information on the tabs, please refer to the section "The tabs" on page 45.
2	Upper window area	Displays the devices, system regions, etc. in list form (the representation displayed depends on the active tab).
3	Buttons area: "Add devices", "Edit devices" and "Delete devices", "Start frequency scan"	 The buttons available depend on the active tab. The "Devices" tab, for example, offers you the following options: Setting new devices Editing already existing devices Deleting devices Starting a frequency scan
4	List box and buttons of the graphical over- view	 Adjusts the RSSI scale of the y-axis: µV, dB, dBm Coms out/zooms in (shortcut key Win: Ctrl + ↑/↓, Mac: cmd + ↑/↓) Generates a report Imports a frequency scan Exports a frequency scan Deletes a frequency scan

Function Element Graphical overview Displays devices, markers, intermodulation products, system regions, usable and unusable frequency bands and frequencies. To navigate horizontally (shortcut key Win: Ctrl + $\leftarrow \rightarrow$, Mac: cmd + $\leftarrow \rightarrow$): O. €. 1 X μV 💌 To zoom the visible area in or out: 0 0 X To move the current position to the left/right: Q Q 🖬 🔄 🖄 🕅 UV 🔻 0.811 M When clicking on "Add freq./band..." in the "Frequencies/Bands" tab or on 1 "Add marker..." in the "Markers" tab, the frequency at the current position of the movable triangle is taken as the default value. To quickly set discrete/interference frequencies by clicking in the graphical overview: TV 47 TV 48 TV 49 TV 50 TV 51 TV 52 TV 53 TV 54 TV 55

Setting	Win	Mac
a discrete frequency,	Click + CTRL	Click + cmd
tolerance +/- 0	or	or
priority: medium	Click + Alt	Click + Alt
an interference frequency,	Click + CTRL + Shift	Click + cmd +Shift
tolerance +/- 0	or	or
priority: blocked	Click + Alt + Shift	Click + Alt + Shift

Element

Function

1

You can also set a frequency by click-dragging a rectangle on the graphical overview:

Setting	Win	Mac	Tolerance
a discrete frequency calcu- lated from the mean value (upper limit, lower limit) priority: medium	Click-drag + CTRL	Click-drag + cmd	mean value - lower limit
an interference frequency calculated from the mean value (upper limit, lower limit) priority: blocked	Click-drag + CTRL + Shift	Click-drag + cmd +Shift	mean value - lower limit

To quickly set usable and unusable frequency ranges by click-dragging a rectangle on the graphical overview:



	Setting a usable frequency range, priority: medium	Win/Mac Click-drag + Alt
	an unusable frequency range, priority: medium	Click-drag + Shift + Alt
 6 Filters for the graphical overview 8 	Views/hides devices, items and frequencies/frequence overview By clicking on the "Device filters (all)", "Sy "Freq./band filters (all)" buttons, you can vie subentries in the graphical overview	y bands in the graphical stem item filters (all)" or ew/hide the corresponding
🧿 "View toggle" icon	Views/hides the graphical overview and the filters	

The tabs

The "Professional Setup" window contains 8 tabs. The tabs 1 to 6 ("Devices" to "Allocation") are arranged from left to right in the most logical order for a live setup:

Devices	System regions	Frequencies/Bands	Spare groups	Coordination	Allocation	Markers	Log messages
Devices	• Sets S	ennheiser devices a	and custom dev	vices and edits	the device	settings	
	 Saves 	devices including t	heir channel na	ames as config	urations ("	Save prese	et")
	 Scans quenc (spect) 	the frequency ranged scan) and detects trum analysis)	ge defined by s used frequen	the selected s cies or interfe	stationary r ring signals	eceivers f from extra	or signals (fre- aneous sources
System reg	ions • Define avoid	es system regions for the calculation of ir	or devices that ntermodulatior	are spatially a products	and tempor	ally separa	ated in order to
	 Limits 	certain devices or o	device groups [.]	to a frequency	range		
Frequencies	/Bands • Sets p the fre	rioritization levels f	for frequencies on (Priority: "L	and frequenc ow", "Medium	ies bands to ", "High")) be taken	into account in
	Marks can be	frequencies and free e excluded from the	equencies band frequency cod	ds as unusable ordination	or being int	erfered w	ith so that they
Spare grou	• Deteri	mines spare frequer	ncy groups for	the most impo	ortant trans	mission li	nks
	Reque efficie	ests a certain numb ent use of the freque	er of spare fre ency spectrum	quencies from	n the coordi	nation wh	ile ensuring an
Coordinatio	Calcul mally	ates intermodulatio coordinates all freq	on-free freque uency require	ncies with dif ments	ferent prior	itization l	evels and opti-
Allocation	Alloca	tes frequencies to c	hannels				
Markers	 Sets confrequence 	olored markers and ency spectrum	labels them wi	th names in or	der to mark	different	positions in the
Log messag	es 🔹 🔹 Displa	ys information, wa	rnings and erro	ors			

Devices – Setting and managing devices

Setting devices



Click on "Add devices...". The "Add devices" window opens:

			Add devices				
System Select exis	ting preset				-		
• Samiese is							
Properties							
Channel Name	Ch 001	-					
Receiver	EM 9046	× A:	I-A8 (470 - 638 MHz)			lavimum noise -87	🕂 dBm
		ertue Anienne Boaster 🗛	-48 (new)				
	a manufacture of the second			-			
Transmitter	SK/SKM 9000	× A:	I-A4 (470.1 - 558 MHz)		•		
4 System frequ	encies			5 Spacing p	arameters		
Overlapping fre	obency range 470.100 🛨	558.000 🛨 MHz			500 - 10-12		
	25 🛨 바				0 🛨 1842	270x 874(5) 0	tittz
					0 🛨 MHz	STX BM(S) 0	1Hz
	Save preset.			-	1	7 Add 1 ÷ chan	
				_			
						8 Add	OK Can

In the "System" area 1, decide whether you want to set Sennheiser devices or custom devices.



- If you have already saved device presets (area 6), they can be selected from the "Preset" list box.
- In the "Properties" area 2, select the naming scheme for your channels ("Channel name").
 - If you use the default channel name "Ch 001" and enter a channel number > 1 in area ? ("Add xx channel"), the channels are numbered consecutively. If, however, you enter an name into the "Channel name" field, all channels of the device will be assigned this name.

If you use Sennheiser devices:

- In the "Devices" area 3, first select your receiver. The other list boxes in the "Devices" area 3 are filled in automatically.
- Adjust the settings in the list boxes according to your needs. Depending on the selected transmitter/receiver combination, the list boxes in "System frequencies" area 4 are filled in automatically.
- If necessary, adjust the minimum frequency spacings 5.
- In area 7 ("Add xx channel"), select the desired number of channels.
- If required, save your entries as a preset (area 6).

Please note that the number of channels selected in area 7 will not be saved.

Click on "Add" 8 to add devices to the "Add devices" window. The "Add" button allows you to add further devices without closing the window.



Please note that the number of channels of the particular device type is added to the device list displayed in the upper window area of the "Devices" tab.

Exit the window by clicking on "OK".



Clicking on "OK" adds one device at a time and then closes the window. If you have added several devices by using the "Add" button, click on "Cancel" to close the window.

If you use custom devices:

The "Properties" area 2 looks different:

Z	Add devices	*
System		
Preset Select existing preset		
🕒 Serrilesse devices 🛛 🔘 Cusan		
2 Properties		I second a second
		Device type FM mic
Channel name Ch 002		Махітит покіє 10 🛨 рУ
Spacing parameters		
Carners 400 🛨 Hrz		
2Tx IM(3) 200 🛨 Htt	2Tx 84(5) 200 🛨 kHz	
3Tix IM(3) 200 🛨 kHz	3Tx IM(5) 200 🛨 kHz	
System frequencies Overlapping frequency range 46	80.000 ÷ - 865.000 ÷ M+t	Frequency / MHz
livearch step 25	± 1+2	
	resuences Load file	
5 Delete presett Save presett	6	Add 1 📩 channel
		Add OK Cancel

- Inform yourself of the technical properties of the used radio system or work with the existing presets (see xml file in the folder ... Application Data\Sennheiser\Wireless Systems Manager\Configuration\Devices-Custom).
- Select a device from the "Device type" list box and specify its maximum noise level.
- If necessary, adjust the minimum frequency spacings.
- Adjust your settings in the "System frequencies" area 4.
- In area 6 ("Add xx channel"), select the desired number of channels.
- If required, save your entries as a preset (area 6).

Please note that the number of channels selected in area 6 will not be saved.

Add devices by clicking on "Add" or exit the window by clicking on "OK".

Example

You set the digital EM 9046 receiver together with 8 SK/SKM 9000 transmitters in the "Devices" area. In the "Channel name" field, you use the default setting "Ch 001":

24			Add devices				×
System							1
Preset Select exit	sting preset				<u>.</u>		
• farmeset is	eres 🔮 Gusan Auro						
2 Properties							
Channel name	Ch 001						
3 Devices							
	EM 9046		A1-A8 (470 - 638 MHz)		Ma	wimum noise -87 🛨 dBm	
		Colorthia Antionna Antonar	A1-AB (new)				
		Decore enterna budoter	AT NO (IIEN)	-			
	SK/SKM 9000		A1-A4 (470.1 - 558 MHz)	_			
4 System frequ	Jencies			5 Spacing pa	rameters		
Overlapping fire	Quency range 470.100	558.000 ÷ MHz		Carriers	500 🛨 MHz		
				2Ta 10(3)	0 🛨 MHz	271x 174(5) 0 🛨 kHz	
	25 -			TTL 114(T)			
				and annual	U	Statement 0	
						0	
6 Delete preset	Save preset					Add 1 🛨 channel	
						8 Add OK Can	cel

After confirming the "Add devices" window by clicking on "OK", the device list **1** is displayed in the upper window area of the "Devices" tab.

If the "Device ranges" check box is activated, the frequency range used by the devices is displayed as a black bar 2 in the graphical overview. The 8 booster ranges of the EM 9046 receiver are displayed as purple bars.



Editing device parameters

		Professional Setup		- 0
Devices System regions Frequen	des/Bands Spare groups Coordination [0]	Allocation Markers Log messages		
Scan Channel name -	Stationary device Frequency range F EM 2731/3722 470.000 - 560.000 MHz 3 M 2002/050 516.000 - 558.000 MHz 3	Prequency Portable device Spare frequencie sell.000 MHz SK5212-II/SKM5200 557/600 MHz SK/SKP/SKM 2000 0		
In Franky 2 In American	FM 500 63 S16.000 S08.000 HM2 3	Edit devices	-	
Add donces Edit dences Delete dences	Descent D		• see 58 •	Denis Rier (d)
<u>don</u> ▼ 70 TV 23 TV 23 TV 23	17.24 - 아버지에 (Second Second S	558.000 <u>1</u> == 21.943 21.943	135 立 Fe 186 立 Fe 185 立 Fe 185 立 Fe 185 立 Fe 195 百 Fe 195 0 Fe 19	TV 40 TV 4) System item fittes (al)
			4 << >> 0K Canel	
-100 -100 -100 agg - 460 - 460	EH 373U3722 - A (170 - 560 H40)			Proj. Jand Rites (R)

To edit channel names and other device parameters using the dialog window:

- From the device list, select a device and click on "Edit devices...".
- Edit the device parameters.

To edit the parameters of other devices when the "Edit devices" window is already open:

 Use the "<<" and ">>" buttons 4 to navigate to other devices. Before you can edit other devices, you are asked to save the changes made to the current dialog window by clicking on "OK".

Fixing the frequency of a device

You can fix the allocated frequency of a device so that the device cannot be allocated a different frequency during coordination.

To fix the frequency of a device:

Devices	System	regions Frequ	enties/liands Si	pare groups 📗 Coundination (0)	Alfocation	Haykers Log	a messages		
Scan	-	Channel name	Stationary device	Frequency range	Frequency	Portable device	Selective antenna booster	Spare frequencies	5
10		EM2000	EM 2000/2050	516.000 - 558.000 MHz	516.000 MHz	SK/SKP/SKM 2000	-	0	
1		EM2050	EM 2000/2050	516.000	516.000 MHz	SK/SKP/SKM 2000			
1	1	EM2050	EM 2000/2050	516.000	516.000 MHz	SK/SKP/SKM 2000		0	
百	-	EM300G3	EM 300 G3	516.000 - Edit devices	516.000 MHz	SK/SKP/SKM 300 G3	5	0	
10	-	EM3731	EM 3731/3732	470.000 -	470.000 MHz	SK5212/SKM5200	*	0	
E	1	EM3731	EM 3731/3732	470.000 - Delete devices	470.000 MHz	SK5212/SKM5200	÷	0	
	10	EM3732	EM 3731/3732	470.000 - 638.000 MHz	470,000 MHz	SK5212/SKM5200	-	0	R

Right-click on a device in the device list and select "Fix frequency" from the shortcut menu 2.

If the frequency of a device is fixed, a lock icon appears next to the frequency of the device 3.

To "unfix" the frequency from the device:

vices	System	regions Frequ	encies/Bands 50	are groups 📗 Coordinatio	n [0] Allocation	Marhers, Log	messages		
In	-	Channel name	Stationary device	Frequency range	Frequency	Portable device	Selective antenna booster	Spare frequencies	
1		EM2000	EM 2000/2050	516.000 - 558.000 MHz	516.000 MHz	SK/SKP/SKM 2000	-	0	
T	-	EM2050	EM 2000/2050	516.000 - 516.000 MHz	516 000 MH	* SK/SKP/SKM 2000			
目	-	EM2050	EM 2000/2050	516.000 - 558.000 MHz	Unfix Frequency	5K/SKP/SKM 2000		0	
E	-	EM300G3	EM 300 G3	516.000 - 558.000 MHz	and a second	5K/SKP/SKM 300 G3	3	0	
E.	-	EM3731	EM 3731/3732	470.000 - 638.000 MHz	Edit devices	5K5212/SKM5200	-	0	
目	-	EM3731	EM 3731/3732	470.000 - 638.000 MHz	Delate devices	5K5212/SKM5200	-	0	
肩	-	EM3732	EM 3731/3732	470.000 - 638.000 MHz	17 01000 PHILE	3K5212/SKM5200		0	

Right-click on the device and select "Unfix frequency" from the shortcut menu.

Deleting devices

- From the device list, select one or several devices and click on "Delete devices..." or right-click on a device and select "Delete devices" from the shortcut menu.
- Confirm the safety query "Do you want to delete xx device(s)?" by clicking on "OK".

Viewing/hiding devices in the graphical overview

Activate/deactivate the "Device ranges" check box in the "System item filters (all)" area.

Viewing/hiding carrier frequencies in the graphical overview

Activate/deactivate the corresponding check boxes in the "Device filters (all)" area.

Changing the sorting of the devices

In the upper window area, click on one of the column headers "Scan", """, "Name", etc.

The devices are sorted in an ascending order according to the entries in the column, an upward pointing triangle appears in the column header: \blacksquare .

To sort the devices in a descending order:

Click again on the column header.
 A downward pointing triangle appears in the column header: .

Performing or importing a frequency scan

Information on performing or importing a frequency scan and on analyzing the frequency spectrum can be found in the chapters "Loading the regional frequency grid, performing a frequency scan and analyzing the frequency spectrum" on page 68 and "Analyzing the frequency spectrum" on page 69.

System Regions – Defining and managing system regions

Defining system regions is useful in the following circumstances:

- You want to operate certain devices or device groups in defined frequency ranges.
- Certain devices are used spatially separated, e.g. on different stages or in different studios.
- Certain devices are used temporally separated.
- Microphone and monitoring systems are to be set and managed separately

You can use the system regions feature to separately set and manage microphone and monitoring systems. This adds a clear visual distinction for a better overview of the systems that are separated according to frequencies. Intermodulation products are calculated as usual.

If certain devices are used spatially separated, they may not be able to influence each other through intermodulation products under certain conditions.

If devices are used temporally separated, intermodulation cannot occur.

In both cases, you should define system regions and inform WSM that there is no risk of intermodulation products. In the "Coordination" tab, usable frequencies are then calculated without taking intermodulation products into account, giving you the maximum spacing between the coordinated frequencies.

Defining system regions

- Make sure that the "Devices" tab contains device data.
- In the "System regions" tab, click on "Add system region..." or rightclick on the blank space of the "System regions" tab and select "Add system region" from the shortcut menu. The "Add system region" window opens:

Add system region...

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7		_	Add	system region			
Reg	pion 01		_				
Devices in th				Devices to the			
2 Jame	Frequency Range	Stationary Device	Portable Device	3 lame	Frequency Range	Stationary Device	Portable Device
Ch 001 Ch 003	470.000 - 558.000 MHz 516.000 - 558.000 MHz	EM <i>3731/3732</i> EM 500 G3	38211210580920041		516.000 - 558.000 M	EM_2000/2050	5K/5K9/5KM 2000
₩ 1112 H	e tergi paraanseen g l'arterma			5 516-000	558.000 🕂 🕬		G OK Cancel

- Enter a name for the system region in the "Name" field 1. The default name "Region 01" is displayed in the "Name" field; as system regions are added, they are numbered in consecutive order.
- From the "Devices in no system region" box 2, select a device or a transmission link and then click on the white right-pointing arrow. The device/transmission link is moved to the "Devices in this system region" box 3.
- Repeat these steps for the other devices/transmission links.

If you can ensure that the devices are used spatially or temporally separated:

> Activate the "Independent calculation of intermodulations" check box.

If you have defined system regions in order to achieve a frequency range separation of systems but you cannot rule out the possibility of interference with other devices:

- Make sure that the "Independent calculation of intermodulations" check box is not activated.
- Exit the window by clicking on "OK" 6.

Example

You define a system region with the name "Stage 1" and move the first 4 transmission links to the "Devices in this system region" box:

ame	Frequency Range	Stationary Device	Portable Device	3	Name	Frequency Range	Stationary Device	Portable Device
005 006 007 008	470.100 - 558.000 M. 470.100 - 558.000 M. 470.100 - 558.000 M. 470.100 - 558.000 M.	EM 9046 EM 9046 EM 9046 EM 9046 EM 9046	SK/SKM 9000 SK/SKM 9000 SK/SKM 9000 SK/SKM 9000	₽	Ch 001 Ch 002 Ch 003 Ch 004	470.100 - 558.000 M 470.100 - 558.000 M 470.100 - 558.000 M 470.100 - 558.000 M	EM 9046 EM 9046 EM 9046 EM 9046 EM 9046	SK/SKM 9000 SK/SKM 9000 SK/SKM 9000 SK/SKM 9000
				¢				

After confirming the "Add system region" window by clicking on "OK", the system region \checkmark is displayed in the upper window area of the "System regions" tab.

If the "System regions" check box is activated, the frequency range used by the system region is displayed as a blue bar (3) in the graphical overview:



Editing system regions

To mark system regions as "independent" without opening the dialog window:

Activate/deactivate the "Independent" check box.

To edit the names of system regions, to mark system regions as "independent" and to edit other parameters using the dialog window:

- In the upper window area, right-click on a system region and select "Edit system region" from the shortcut menu or select a system region and click on "Edit system region...".
- Edit the parameters of the system region.

Deleting system regions

- In the upper window area, right-click on one or several system regions and select "Delete system region" from the shortcut menu or select a system region and click on "Delete system region...".
- Confirm the safety query "Do you want to delete xx system region(s)?" by clicking on "OK".

Viewing/hiding system regions in the graphical overview

To view/hide all system regions:

Activate/deactivate the "System regions" check box in the "System item filters (all)" area.

Changing the sorting of the system regions

In the upper window area, click on one of the column headers "Name", "Frequency range", etc. The system regions are sorted in an ascending order according to the

entries in the column, an upward pointing triangle appears in the column header: .

To sort the system regions in a descending order:

Click again on the column header.
 A downward pointing triangle appears in the column header: .

Frequencies/bands – Setting prioritization levels for the frequency coordination and excluding frequencies from the frequency scan

The "Frequencies/Bands" tab allows you to mark frequencies and frequency bands as unusable or being interfered with so that they are excluded from the frequency coordination.

In addition, you can specify how frequencies and frequency bands are to be prioritized in the frequency coordination (Priority: "Low", "Medium", "High"). If, for example, you set the prioritization level for a license frequency to "High", this frequency will be highly prioritized in the frequency coordination.

Setting frequencies/frequency bands



In the "Frequencies/Bands" tab, click on "Add freq./band..." or rightclick on the blank space in the upper window area of the "Frequencies/ Bands" tab to add the frequency or band. The "Add frequency/band" window opens:



Select a preset from the "Preset" list box.

or

Select a frequency type from the "Type" list box 2. The corresponding option button in the "Priority" area 3 is automatically selected by default.

Frequency type	Priority default
Discrete frequency	"Medium"
Interference frequency	"Blocked"
Usable band	"Medium"
Unusable band	"Blocked"

- If necessary, adjust the prioritization level for the coordination of usable frequencies/bands in the "Priority" area 3.
- Adjust the noise level 3.
- If required, save your settings as a preset or delete existing presets in area 4.
- Exit the window by clicking on "OK".

Example

You set an unusable frequency band named "TV Channels" for the 523.147 to 526.447 MHz frequency range:



After confirming the "Add frequency/band" window by clicking on "OK" **6**, the unusable frequency band **7** is displayed in the upper window area of the "Frequencies/Bands" tab (see following page).

In the graphical overview, the unusable frequency band (8) is highlighted in transparent red:



Note that the tolerances of discrete frequencies and Interference frequencies are given in brackets (e.g. +/- 500 kHz).



Importing licensed frequencies

You can import licensed frequencies that are available as follows:

- Extension: .csv
- Frequency data is to be written as follows:
 - MHZ (z. B. 600; 600.0) or
 - MHz.kHz (e.g. 600.768; 600.7; 600.76) or
 - MHz,kHz (e.g. 600,768; 600,7; 600,76)
- Delimiters:
 - ; (#59) or
 - | (#124) or
 - : (#58) or
 - tab (#09) or
 - \CR (#0D)

To import licensed frequencies:

- Click on "Import licenses..." in the upper window area.
- Select the text file and then click on "OK". The frequencies are imported as usable discrete frequencies with a high prioritization level in the frequency coordination.

Importing frequency lists

You can import frequencies/bands that are available as comma-separated value files:

- Extension: .csv
- Frequency data is to be written as follows:
 - MHZ (e.g. 600; 600.0) or
 - MHz.kHz (e.g. 600.768; 600.7; 600.76) or
 - MHz,kHz (e.g. 600,768; 600,7; 600,76)

- Delimiters:
 - ; (#59) <mark>or</mark>
 - | (#124) or
 - : (#58) or
 - Tab (#09) or
 - \CR (#0D)

To import frequency lists:

- Click on "Import list..." in the upper window area.
- Select the text file and then click on "OK". The frequencies are added to existing or imported frequencies.

Exporting frequency lists

You can export existing frequencies/bands as comma-separated files.

- Extension: .csv
- The following data must be exported as semicolon-separated values:
 - name
 - type
 - frequency data in kHz (e.g. 600000 or 600768)
 - tolerance
 - lower frequency (in the case of discrete or interference frequencies, the lower frequency equals the discrete/interference frequency)
 - upper frequency (in the case of discrete or interference frequencies, the upper frequency equals the discrete/interference frequency)
 - priority
 - noise level
- Click on "Export list..." in the upper window area.
- Specify the storage location, select a name for the csv file and then click on "OK".

Analyzing the frequency spectrum

You can analyze the frequency spectrum or set and/or import frequencies/frequency bands. If the corresponding button is grayed out, you have not yet performed a frequency scan in the "Devices" tab.

- Charge the regional frequency grid of your country (see page 68).
- Make sure that you have performed a frequency scan in the "Devices" tab or that you have imported scanned frequencies (see page 51).
- Analyze the frequency spectrum by clicking on "Analyze frequency spectrum..." in the upper window area of the "Frequencies/Bands" tab.

You can reduce the interference frequencies for any scan data by increasing the noise threshold to the desired value. The noise threshold is indicated by a red line in the graphical overview. You can view/hide the noise threshold line in the graphical overview by activating/deactivating the "Noise threshold" check box in the "System item filters" area.

Scan data can also be viewed/hidden in the graphical overview by activating/deactivating the "Scan data" check box in the "System item filters" area.

Editing frequencies/bands

From the upper window area, select a frequency/band and click on "Edit freq./band...".

Edit the parameters of the frequency/frequency band.

Deleting frequencies/bands

- From the upper window area, select a frequency/band and click on "Delete freq./band...".
- Confirm the safety query "Do you want to delete xx frequency/ band(s)?" by clicking on "OK".

Viewing/hiding frequencies/bands in the graphical overview

To view/hide individual frequencies/bands:

Activate/deactivate the eye icon """ in the upper window area.

To view/hide usable, unusable or interfering frequencies/bands in groups:

Activate/deactivate one or several check boxes in the "Freq./band filters (all)" area.

To view/hide all usable, unusable or interfering frequencies/bands:

Activate/deactivate the "Freq./band filters (all)" button.

Changing the sorting of the frequencies/bands

In the upper window area, click on one of the column headers ">", "Name", "Type", etc.

The frequencies/bands are sorted in an ascending order according to the entries in the column, an upward pointing triangle appears in the column header:

To sort the frequencies/bands in a descending order:

Click again on the column header.
 A downward pointing triangle appears in the column header: .

Spare Groups – Defining and managing spare frequency groups

The "Spare groups" tab allows you define groups of radio systems for which a specified number of shareable spare frequencies is to be calculated.

A spare frequency group can consist of different systems (e.g. Digital 9000 and 2000 series). One condition for this is, among other things, that the frequency ranges of the systems overlap.

The WSM calculates the possible spare frequencies within the overlapping frequency range which are compatible with all systems of the spare frequency group.

If the operating frequency of a system is being interfered with, you can choose from a defined number of compatible frequencies that allow for flexible use.

Defining spare groups

Make sure that the "Devices" tab contains device data.

Add spare group...

In the "Spare groups" tab, click on "Add spare group...". The "Add spare group" window opens:

EA	-	Add spare	e group		×
Name Spare Group 001	_				
No system region	3	Name	Frequency Range	Stationary Device	Portable Device 6
Region 01	- 100				
	4				
	\Diamond				
	- 100				
		101	_		10
	5				
			ore helesters 1 -	÷ 4	Cancel

- Enter a name for the spare group in the "Name" field 1. The default name "Spare Group 001" is displayed in the "Name" field; as spare groups are added, they are numbered in consecutive order.
- From the "Devices" box 2, select a system region and then a transmission link and ...
 - click on the white right-pointing arrow to move the transmission link to the "Group members" box 3 or
 - with the left mouse button pressed, drag the transmission link into the "Group members" box 3.
- Repeat these steps for the other transmission links.

If you select a device from a system region in the "Devices" box 2 to add it to the "Group members" box 3, only devices having an overlapping frequency range with the selected device are listed in the "Devices" box 2. All other devices are hidden.

▶ In the "Number of spare frequencies" field 4, enter the number of spare frequencies to be available in case of need. This number is displayed in the "Spare frequencies" column in the "Devices" tab.

The overlapping/shared frequency range for the devices added in the spare group is shown behind "Shared frequency range" (5). This shared frequency range is considered for coordination.

The "Portable device" column 6 in the "Group members" box 3 lists the available portable device for each stationary device in the list.

Exit the window by clicking on "OK" 7.

After confirming the "Add spare group" window by clicking on "OK", the spare group (8) is displayed in the upper window area of the "Spare groups" tab.

If the "Spare groups" check box is activated, the frequency range used by the spare group is displayed as a gray bar 9 in the graphical overview.



Example

You define a spare group with the name "Madonna" and move 3 transmission links to the "Group members" box:

H -	Add spa	re group		×
Madonna	3 croup me			
 No system region 	Name	Frequency Range	Stationary Device	Portable Device
 Experior (48) Ch 003 SR 2000/2050-IEN Ch 001 	Ch 005 Ch 004 Ch 002	516.000 - 558.000 M. 516.000 - 558.000 M. 470.000 - 638.000 M.	EM 2000/2050 EM 300 G3 EM 3731/3732	SK/SKP/SKM 2000 SK/SKP/SKM 300 G3 SKS212-II/SKM5200-I
Prospatible de sons are not decampel	5 divided in 4 Number	naen y / ange - \$15.000 - \$58.0 / gant fitta anders	oog teety	7 OK Cancel

The shared/overlapping frequency range of the devices is shown behind "Shared frequency range" **(5)**. After confirming the "Add spare group" window by clicking on "OK" **(7)**, the spare group is displayed in the upper window area of the "Spare groups" tab.

Editing spare groups

- From the upper window area, select a spare group and click on "Edit spare group...".
- Edit the parameters of the spare group.

You can edit any parameter (e.g. name, number of spare frequencies). You can also remove devices from the "Group members" box 3 by selecting the device and clicking on the left-pointing white arrow.

Deleting spare groups

- From the upper window area, select a spare group and click on "Delete spare group...".
- Confirm the safety query "Do you want to delete xx spare group(s)?" by clicking on "OK".

Changing the sorting of the spare groups

In the upper window area, click on one of the column headers "Name", "Frequency range", "Number of devices", etc. The spare groups are sorted in an ascending order according to the entries in the column, an upward pointing triangle appears in the column header: .

To sort the spare groups in a descending order:

Click again on the column header.
 A downward pointing triangle appears in the column header: .

Coordination – Coordinating intermodulation-free frequencies

The "Coordination" tab allows the calculation and coordination of intermodulation-free frequencies that are suitable for the prespecified frequency conditions.

The coordination depends on the following parameters:

- Devices set in the "Devices" tab
- Settings made in the "System regions", "Frequencies/Bands" and "Spare groups" tabs

Starting the coordination

- Make sure that the "Devices" tab contains device data (either selfentered or automatically read in).
- Check if all the desired settings have been made in the "System regions", "Frequencies/Bands" and "Spare groups" tabs.
- In the upper window area of the "Coordination" tab, click on "Start coordination".

The coordination of intermodulation-free frequencies starts.

- The coordination results are displayed on the left hand side 1 of the upper window area and are continuously updated.
- The header 2 of the "Coordination" tab displays the number of coordination results. This information remains visible even when you change to another tab.
- If you select a coordination result, the coordinated frequencies are displayed in the "Selected coordination" box 3 on the right hand side of the upper window area and are also shown as solid, colored lines 4 in the graphical overview.
- In addition, the calculated intermodulation products (5) are displayed.

Start-coordination

61						- 3	Professiona	al Setup					- 8 ×
Devices	System	regions Frequencies/Bands	Spa	re group	cordination [6]	Alloca	tion N	arkee	Log messar	jec i			
				-2		Salar Ind. co.	antination						
Denit no.	1H rating ()	Priorities	Unusabl	Pre-allocated	r 3	Fremetoy	Di rating	Noise	Priority	Broet system	System region	Spacings	
Current state	0%	H:: 0 / Hed: 0 / Lo: 0 / Undef: 0	10	0		\$27,800 MH2	100%	107 dBm	Undefined	El El mir		Comer: >400kHz / 2TX 04(3) 400kHz / 3TX 04(3)	1) 400kHz / 2TX-JM(5): 400kHz /
2	100%	Hi: 0 / Med: 0 / Lo: 0 / Undef: B	.2	0		533.400 Met	100%	-107 dBm	Undefined	El El mir	-	Carrier: s400kHr / 2TX-D/(3): 400kHr / 3TX-D/(3)	1) 400kHz / 2TK M(5): 5400kHz
3	100%	Hi: 0 / Med: 0 / Lo: 0 / Undef: 8	2	0		535 400 MM	100%	-107 dBm	Lindefined	0154		Carrier = 400kHr / 27X (M(3)) 400kHr / 37X (M(3)	D: 4000Hz / 2TC M(5): > 4000Hz
5	100%	HI: 0 / Med: 0 / Lo: 0 / Undef: 10	ō	ő		537.000 MHz	100%	-107 dBm	Undefined	Other		Carrier: >400kHz / 2TX-IM(3): 400kHz / 3TX-IM(3	1: 400kHz / 2TK-IM(5): >400kHz
6	100%	H:: 0 / Med: 0 / Lo: 0 / Undef: 10	0	0		538,200 MH	100%	-107 dBm	Undefined	Other		Camer: =400kHz / 2TX-IM(3): 400kHz / 3TX-IM(3	1): 400kHz / 2TX IM(5): >400kHz
/	100%	HE 0 / Med: 0 / Lo; 0 / Unitel: 10	0	0	Pause coordination	541.400 MHz	100%	-107 dBm	Undefined	EN mic		Carrier: >400kHz / 2TX-U4(3): 400kHz / 3TX-U4(3)	1: 400kHz / 2TG-IM(5): >400kHz
					The other Designation of the local division of the local divisione	545.600 MHz	100%	-107 dBm	Lindefined	FM: Ste		Carrier: >400kHr / 2TX-IM(3): 400kHr / 3TX-IM(3	1: 400kHz / 2TGIM(5): >400kHz
					and the second se	553.800 MHz	100%	-107 dBm	Undefined	EN mic		Carrier: >400kHz / 2TX-DM(3); >400kHz / 3TX-DM	(3): 400kHz / 2TX-IN(5): 400kHz
						634.050 MHz	100%	-107 dBm	Undefined	D9000	~	Carrier: 600kHz / 2TX-3H(3): >600kHz / 3TX-3H(3	1): 600kHz / 2TX-IM(5): >600kHz
						634.650 MHz	10046	-107 dBm	Undefined	D9000		Carrier: 600kHz / 2TX-B4(3): >600kHz / 3TX-B4(3	3): 600kHz / 2TK-IM(5): >600kHz
						President and a state							
						101							13
G			_	_		_			_	_	_		6 Device filters (all)
- VI	5	1V 26 1V 27	TV 28		5 Tr 30			17 52	102		FV 34	1946 TV 36 TH 27	
				4		5							System dem frees (all)
		-			CT0 1414								
				me500-G3 - A (516	- SSI Merel								
				CHOOLOGICAL COLO									
	_			and all les - Nin (a l	u - alle Peru)		10 C 10 Miles						M 2
						1 30-10 - M13-00 (1	00-030 PP12)						These Incomes
					DVP1	availavas -c (-	1.000.000	a a a					They best Barriel
							L (470 - 600 P	*4)					Preg. (band mans (al)
-500		-		Spare Group 001 (5)	6 - 558 MHz)								2
100	140	HL LE	- 2	125	He Hi	386 3	16 A	e. 24			-	101 ME 1911 ME	Riberts Dearmer
								17-11-1	and a second				

Changing the sorting of the frequencies

In the "Selected coordination" box ③ on the right hand side of the upper window area, click on one of the column headers ("Frequency", "IM Rating", "Priority", etc.).

The frequencies are sorted in an ascending order according to the entries in the column and an upward pointing triangle appears in the column header: \blacksquare .

To sort the frequencies in a descending order:

Click again on the column header.

A downward pointing triangle appears in the column header: .

Viewing/hiding frequencies in the graphical overview

To view/hide individual frequency groups:

Activate/deactivate the corresponding check boxes ("D9000", "FM mics", "IEM systems" or "Others") in the "Device filters" area 6.

To view/hide all frequencies:

Activate/deactivate the "Device filters (all)" button.

Viewing/hiding intermodulation products in the graphical overview

To view/hide intermodulation products:

Activate/deactivate the "Intermodulation" check box in the "System item filters" area 7.

Allocation – Allocating frequencies to channels and editing allocations

The "Allocation" tab allows you allocate frequencies to channels, either by drag and drop or automatically, and to edit the allocations.

Selecting a coordination result for the allocation

- Make sure that you have calculated intermodulation-free frequencies in the "Coordination" tab.
- From the "Coordination" tab, select a coordination result for the allocation:

Devices	System r	egions	Frequen	cies/Bands	Spare	groups 🔁
Result no.	IM rating Ø	Priorities			Unusable	Pre-allocated
urrent state	0%	Hi: 0 / Me	d: 0 / Lo: 0	/ Undef: 0	10	0
2	100%	Hi: 0 / Me	d: 0 / Lo: 0	/ Undef: 8	2	0
3	100%	Hi: 0 / Me	d: 0 / Lo: 0	/ Undef: 8	2	0
f	100%	Hi: 0 / Me	d: 0 / Lo: 0	/ Undef: 8	2	0
5	100%	Hi: 0 / Me	d: 0 / Lo: 0	/ Undef: 10	0	0
5	100%	Hi: 0 / Me	d: 0 / Lo: 0	/ Undef; 10	0	0
7	100%	Hi: 0 / Me	d: 0 / Lo: 0	/ Undef: 10	0	0

Change to the "Allocation" tab.

The frequencies are displayed in the "Selected coordination" box (2) on the left hand side and the channels are displayed in the "Allocations" box (3) on the right hand side of the upper window area:

							- A TONE SHIT	and the state of t						
Devices	System	regions	Frequenci	es/Bands	Spare groups	Coordination [6]	Allocation	Harkers Log me	ssages					
elected co	ordination								Designation frequences of	Allocations				
Trequercy	IM rating	Noise	Priority	Target system	System region	Spacings				3 Channel name	Status	Frequency	Device type	Frequency range
27 800 MHz	100%	-107 dBm	Undefined	FH mic		Carrier: >400kHz / 2TX-3H(3): 400kHz / 3TX-IH(3): 400k5	z / 2TX-3H(5): 400kHz /	W HORKING INDEL	Ch 001	0		1EM	516.000 - 558.000 +
3.400 MHz	100%	-107 dBm	Undefined	E FM mc		Carrier: >400kHz / 2TX-3M(3): 400kHz / 3TX-IM(3): 400kH	tz / 2TX-BM(5): >400kHz	Alterated frequency	Ch 002	Q.		FM mic	470.000 - 638.000 M
5.400 MHz	100%	-107 dBm	Undefined	Cther		Carrier: >400kHz / 2TX-3M	3): 400kHz / 3TX-IM(3): 400kH	12 / 2TX-B4(5): >400kHz	X to Realistic III shorts	Ch 003	2		FM mic	516.000 - 558.000 #
7.000 MHz	100%	-107 dBm	Undefined	Cther		Carrier: >400kHz / 2TX-3MC	3): 400kHz / 3TX-IM(3): 400kF	12 / 2TX-B4(5): >400kHz	Allocate automatically	Ch 004	X		FM mic	516.000 · 558.000 /
.200 NHz	100%	-107 dBm	Undefined	Other		Carrier: >400kHz / 2TX-IMC	3): 400kHz / 3TX-IM(3): 400kHz	tz / 2TX-B4(5): >400kHz	HIPLACE AUTOMOTION	Ch 006	ò		09000	630.100 - 638.000 /
400 MHz	100%	-107 dBm	Undefined	FM FM mc		Carrier: >400kHz / 2TX-BH/	2): 400kHz / 3TX-B4(3): 400kH	tr / 2TX-BH(5): >400kHz	Division and Division and	Ch 007	Ó		D9000	630.100 - 638.000
.600 MHz	100%	+107 dBm	Undefined	IEM: Ste		Carrier: >400kHz / 2TX-IM(3): 400kHz / 3TX-IM(3): 400kHz	12 / 2TX-IN(5): >400kHz	Send to connected device	Spare Group 003	0		Other	518,000 - 558,000
ROD NH	100%	-107 dam	Undefined	R Fat mr		Carrier: >400kHz / 2TX-BH	3): >400kHr (3TX-14(3): 400	HT / 2 TK-IM (5): 400kHz	- Should be write the state	Spare Group 003	2		Other	516.000 - 558.000
.050 MHz	100%	-107 dBm	Undefined	D9000	-	Carrier: 600kHr / 2TX-IM(3)): >600kHt / 37KBM(3): 600ks	er / 2TC-IM(5): >600kHz		Spare Group 001	9		Other	516.000 - 550.000 1
ARA MO-	1002	-107 dbm	lindefined	00000	-	Carrier GOORU: / 2TV-BA(2)		- / STV.B/(5) 60064						
0			È R										6	Device filters (al
		1V 26		#	TV 28		• 71 M	TV 2	n 82 11 34	77.55	TV 28		6	Device filters fail
20 U		™ № ™ № 4		# 5	TV 78 en300 63	T 23 TV 3	0 71 8	N 2 (n 55 - n 34	TV 50.	TV 28			Desice filters (all)
	29	∎ R ™>≍		5	TV 75 en330 G3 en500 G3	- A (516 - 558 H+2) - A (516 - 558 H+2)	0 71 8/	112	17.38 TV 34	TV (5.	TV 28			Deske filters (al)
		₹ 2 72 %		5	TV 28 es300 G3 ex500 G3 2000 Same	- A (516 - 558 He/z) - A (516 - 558 He/z) - A (516 - 558 He/z) - An (518 - 558 He/z)		17.22	na n	77.56	TV 28			Desice filters (all a b system item filters (a b c c c c c c c c c c c c c
		й р 17 ж (4		# 5	TV 28 en300 (3 en500 (3 3000 Sartes	-A (516 - 508 H4z) A (516 - 508 H4z) A (516 - 508 H4z) -As (518 - 508 H4z)	0 Ty BL	TY 22	17.25 Tr 34	77.50	TV 20			Device News Gall
		1 P. 17 M. (4)		<i>n</i> 5	TV 28 en300 G3 en500 G3 3000 Saras	- A (516 - 558 H42) - A (516 - 558 H42)	0 71 8 PM 9045 - A1 A2 (470 - 628 M PM 9771(2)72 - 1 (470 - 628 M	TV 22	TV 34	77.00	TV 28			Desix files (d)
	39	7 X 1 4		#	1V 28 ex303 G3 2003 Great	- A (516 - 538 H#2) - A (518 - 538 H#2)	0 EH 30-6 - A1 AQ (170 - 630 H EH 371/1272 - 1 (479 - 631 25/122-21/9H/330) II - 1 (479 - 6	19 22 1 Hel Hel 30 MHz)	17.54 Tr 34	n 94	TV 38			Desice Rivers Sof

Filtering the displayed allocations in the "Allocation" box

Select a device in the "Selected coordination" box to filter the allocations in the "Allocations" box so that only the allocations possible for the selected device are displayed.

Allocating frequencies

Using drag and drop, drag the frequencies from the "Selected coordination" box (2) and drop them on channels in the "Allocations" box (3).

or

Automatically allocate frequencies to channels by clicking on "Allocate automatically".

Allocated frequencies appear as dotted lines in the graphical overview.

Deleting allocations

To delete individual allocations:

Click on the allocations and drag them from the "Allocations" box 3.

To delete all allocations:

Click on "Delete all allocations..." in the upper window area of the "Allocation" tab.

Sending allocations to connected devices

Click on "Send to connected devices..." in the upper window area of the "Allocation" tab.

If the squelch level of online devices is less than the noise level of the frequencies allocated to the devices, the following window opens, showing the recommended squelch levels for the listed devices.

Channel name	Squeich	Mono/Stereo
5R300G3	√ -1 dB -> 25 dB	3 OK
EM500G3	▼ 5 dB -> 25 dB	OK
EM3731	🔽 0 μV -> 18 μV	OK
EM3731	🔽 Ο μV -> 18 μV	OK
EM300G3	▼ 5 dB -> 25 dB	OK
EM2000	▼ 5 dB -> 25 dB	OK

The recommended squelch levels are sent to the corresponding devices together with the allocated frequencies.

If you want to continue using the previously set squelch levels:

- In the "Squelch" column, deactivate the check boxes for the corresponding devices and click on "Continue".
 - Before you can change parameters such as the squelch level, you must activate the "Remote Access" menu item in the "System" menu.



When you click on "Continue", the "Sending status" window opens.

The "Sending status" window shows a progress bar **8**, indicating the progress of frequency allocation to the connected devices in percent. The list of messages **9** displays progress information in text form.

Changing the sorting of the frequencies and/or channels

 In the "Selected coordination" box 2 and the "Allocations" box 3 of the upper window area, click on one of the column headers. The frequencies/channels are sorted in an ascending order according to the entries in the column, an upward pointing triangle appears in the column header:

To sort the frequencies/channels in a descending order:

Click again on the column header.
 A downward pointing triangle appears in the column header: .

Viewing/hiding frequencies in the graphical overview

To view/hide individual frequency groups:

Activate/deactivate the corresponding check boxes ("D9000", "FM mics", "IEM systems" or "Others") in the "Device filters" area 6.

To view/hide all frequencies:

Activate/deactivate the "Device filters (all)" button.

Viewing/hiding intermodulation products in the graphical overview

To view/hide intermodulation products:

Activate/deactivate the "Intermodulation" check box in the "System item filters" area 7.

Markers – Setting and editing markers

The "Markers" tab allows you to set colored markers and label them with names in order to mark certain positions in the frequency spectrum.

Setting markers



- Enter a name and select a frequency and a color.
- Enter a comment if necessary.
- Exit the window by clicking on "OK".

Example

You set a white marker with the name "Reference" for the frequency of 523.247 MHz:

Add marker
Reference
523.247 m
OK Cancel Apply

After confirming the "Add marker" window by clicking on "OK", the marker **5** is displayed in the upper window area of the "Markers" tab.

In the graphical overview, the marker appears as a vertical line 0. The upper end of the marker shows a downward pointing triangle and the label of the marker:



Editing markers

- From the upper window area, select a marker and click on "Edit marker..."
- Edit the parameters of the marker.

Deleting markers

- From the upper window area, select a spare group and click on "Delete marker...".
- Confirm the safety query "Do you want to delete xx marker(s)?" by clicking on "OK".

Viewing/hiding markers in the graphical overview

To view/hide individual markers:

Activate/deactivate the eye icon "^m" in the upper window area.

To view/hide all markers:

Activate/deactivate the "Markers" check box in the "System item filters" area.

Changing the sorting of the markers

In the upper window area, click on one of the column headers "s", "Name", "Frequency" etc.

The markers are sorted in an ascending order according to the entries in the column, an upward pointing triangle appears in the column header: \blacksquare .

To sort the markers in a descending order:

Click again on the column header.
 A downward pointing triangle appears in the column header: .

Loading the regional frequency grid, performing a frequency scan and analyzing the frequency spectrum

After having made all relevant settings in the tabs of the "Professional Setup" window, you can now perform the following steps.

Information on the regional frequency grid

The regional frequency grid provides information on which frequencies in your country are reserved for primary use (TV broadcasters, mobile phone operators, etc.). The frequencies' availability for secondary use by your radio systems can be determined manually using the regional grid or by means of an automatic spectrum analysis. Always make sure to comply with the regulatory and legal requirements for secondary use. Check if a more appropriate or up-to-date regional grid definition is available for your venue, e.g. as a download from the Sennheiser website at www.sennheiser.com.

- Analyze the frequency spectrum at your venue (see page 69).
- Read and follow the regulatory and legal requirements for secondary use by your radio systems.

Loading the regional grid bar of your country

- Right-click on the active regional grid bar.
- Click on "Change regional grid...".
- Select the desired file and then click on "Open".

Performing or importing a frequency scan

To perform a frequency scan at the venue of the planned event:

- In the "Devices" tab, activate the desired devices in the "Scan" column of the device list.
- Click on "Start frequency scan" in the buttons area 4.

To import a frequency scan:

Click on the "Import frequency" button in the graphical overview. After the frequency scan has been performed/imported, the scan result appears transparent light blue in the graphical overview:



Devices Sy
Scan



Analyzing the frequency spectrum

Change to the "Frequencies/Bands" tab and click on "Analyze frequency spectrum...".

The analysis result appears in list form in the upper frequency window and is also displayed graphically in the graphical overview.

-	Name	Тур	Frequenz/Bereich	Priorität	Störpegel
-	FM Tx - 01	Störfrequenz	525,037 MHz	🗙 Nicht nut	tzbar 5 dB
-	FM Tx - 02	Störfrequenz	529,137 MHz	X Nicht nut	tzbar 5 dB
-	FM Tx - 03	Störfrequenz	529,325 MHz	🗙 Nicht nut	tzbar 5 dB
-	FM Tx - 04	Störfrequenz	529,450 MHz	X Nicht nut	tzbar 5 dB
-	FM Tx - 05	Störfrequenz	529,575 MHz	🗙 Nicht nut	tzbar 5 dB
-	FM Tx - 06	Störfrequenz	529,700 MHz	🗙 Nicht nut	tzbar 5 dB
-	FM Tx - 07	Störfrequenz	530,625 MHz	× Nicht nut	tzbar 5 dB
-	FM Tx - 08	Störfrequenz	530,800 MHz	X Nicht nut	tzbar 5 dB
-	FM Tx - 09	Störfrequenz	550,037 MHz	X Nicht nut	tzbar 5 dB
-	FM Tx - 10	Störfrequenz	562,537 MHz	× Nicht nut	tzbar 5 dB



Usable frequency ranges are displayed in transparent green (can be viewed/hidden via the "Usable bands" check box in the "Freq./band filters" area.

Unusable frequency ranges are displayed in transparent red (can be viewed/hidden via the "Unusable bands" check box in the "Freq./band filters" area).

Interference frequencies appear as vertical orange lines (can be viewed/ hidden via the "Interference frequencies" check box in the "Freq./band filters" area):



Interference frequencies are not taken into account in the intermodulation calculation and are ignored when new frequencies are placed.

Discrete frequencies appear as vertical green lines (can be viewed/hidden via the "Discrete frequencies" check box in the "Freq./band filters" area):



These frequencies can be prioritized in the calculation over overlapping usable frequencies or undefined frequencies by assigning them a higher priority.

- Evaluate the result of the spectrum analysis:
 - Are there any interference frequencies or frequency bands that are marked as occupied but you know for sure that they can be used?
 - Are there any frequencies/frequency bands that are marked as usable but you know for sure that they cannot be used?
 - Do the settings in the "Priority" column still apply to your current transmission situation?
- Adjust the result of the frequency spectrum analysis:
 - From the upper frequency range, select the entries and click on "Edit freq./bands...".
 - Modify the desired settings.

Coordinating and allocating frequencies

You can coordinate frequencies and allocate these frequencies to channels as described in the chapters "Coordination – Coordinating intermodulation-free frequencies" on page 61 and "Allocation – Allocating frequencies to channels and editing allocations" on page 63.
Working with scenes

The WSM allows you to define views, the so-called "scenes". In each scene, you can set up and move panels (see "Working with panels" on page 76). Thus, the scenes only display the transmission links relevant to you.

Master Scene Band 1

When you create a new configuration, there is first only the "Master Scene".

The "Master Scene" has the following particularities in comparison with other scenes:

- As soon as a new device is detected, it automatically appears as a panel in the "Master Scene". All other scenes are not affected. The "Master Scene" is an overview help. Therefore, do not use the "Master Scene" for configurations that you want to use repeatedly.
- You cannot delete or rename the "Master Scene".

Adding new scenes

- Scenes

 Add new scene
 Ctrl+N

 Rename scene...
 F2

 Copy Scene/Select and Copy All

 Paste
 Ctrl+V

 Select all channels
 Ctrl+A

 Delete scene
 Image: Ctrl+A

 Select Scene
 Image: Ctrl+A

 New label
 Image: Ctrl+A
- Click on "Scenes" > "Add New Scene". The new scene is added. A new tab with the name "Scene 1" appears.

Master Scene Band 1	Band 2	Final
---------------------	--------	-------

The display area of the scene is empty at first.

You can now drag panels in the new scene (see page 76) or use the scene for one of the tools (see page 92).

Selecting a scene



Click on the tab of the desired scene. The scene appears in the display area.

\cap	r٠
U	••



- Click on "Scenes" > "Select Scene".
 The submenu containing the names of the scenes appears.
- Click on the desired scene.
 The scene appears in the display area.

Scenes

Paste

Select Scene

Add new scene

Ctrl+N

Renaming a scene

You cannot rename the "Master Scene".

To rename other scenes:

Click on the tab of the scene you want to rename.

Master Scene	Band 1	Band 2	Final
--------------	--------	--------	-------

Click on "Scenes" > "Rename Scene..." or press the "F2" key. The "Rename" window appears.

Scene		
Name: Sze	ne 1	-

- Enter a new name for the scene.
- Click on "OK".

The entered name appears on the tab.

Copying and pasting scenes

You can copy the contents (panels or tools) of a scene and paste them into a new scene.

To copy the contents of a scene and paste them into another:

Master Scene	Band 1	Band 2	Final
			1 11 104

- Click on the tab of the scene you want to copy.
- Click on "Scenes" > "Copy Scene".
- Click on "Scenes" > "Paste Scene". The contents of the copied scene are pasted.

Deleting a scene

When deleting a scene, the configuration of the devices is retained.

You cannot delete the "Master Scene".

Master Scene Ban	d 1 🛛 Band	2 Final
------------------	------------	---------

Click on the tab of the scene you want to delete.

Scenes	
Add new scene	Ctrl+N
Rename scene	F2
Copy Scene/Select and C	opy All
Paste	Ctrl+V
Select all channels	Ctrl+A
Delete scene	
Select Scene	P
A New label	

Add new scene	Ctrl+N
Rename scene	F2
Copy Scene/Select an	d Copy All
Paste	Ctrl+V
Select all channels	Ctrl+A
Delete scene	
Select Scene	9
New Jabel	

Click on "Scenes" > "Delete Scene". The "Delete" window appears.



 Click on "Yes". The scene is deleted.

Scene commentary (label)

You can paste labels into a scene to provide a better overview. The labels can be freely dragged and re-sized.

Pasting labels

- Scenes

 Add new scene
 Ctrl+N

 Rename scene...
 F2

 Copy Scene/Select and Copy All

 Paste
 Ctrl+V

 Select all channels
 Ctrl+A

 Delete scene
 Select Scene

 Select Scene
 Mew label
- In the "Scenes" menu, click on > "New Label". A label appears in the scene. The cursor blinks in the middle of the label.
- Enter your commentary. The font size is automatically adjusted to the size of the label.



SRs Edit Delete To change the text at a later time:

- Right-click on the label. A submenu appears.
- Click on "Edit".
- The cursor appears in the text.
- Change the text in the label.

Dragging labels

- Click on the label.
 - The move symbol appears.
- Move the label to the desired position.

Re-sizing labels

- Click on the edge of the label. Selection points appear at the edge of the label.
- Drag on one of the selection points to change the size of the label. Dragging one of the corner selection points changes both the height and width of the label.





			9	D.				
	-	_	0	1 45		P.40		
						Edit		
					- T	1000		
•	•	+	÷	•	•	Delete	•	

Deleting labels

- Right-click on the label. A submenu appears.
- Click "Delete". The cursor appears in the text.
- Change the text in the label. The label is deleted.

Working with panels

The WSM enables you to keep a clear overview of even large systems (see page 13). The scalable panels display the most important parameters of your transmission links.

Creating panels

To create a new panel:

- In the system window, click on the "Devices" tab.
- Click on a device and keep the mouse button pressed.
- Drag the device in the scene.
 - A new panel appears in the scene.

In the system window, an eye appears next to the device. The eye indicates that the corresponding device is displayed in the currently selected scene as a panel.

Enlarging/reducing panels

So 25 10 3 Dev Batt Dev Batt There is a dashed area in the lower right corner of the panel.

To steplessly reduce or enlarge the panels:

- Click on the dashed area.
- Keep the mouse button pressed and drag the panel to the left (= reduce) or to the right (= enlarge).
 - When you considerably zoom out a panel, the scales are hidden to provide a better overview.

Selecting several panels

When you select several panels, you can move, copy and cut them simultaneously, you can display the common parameters of the channels and you can edit these channel parameters (see page 84).

To select several panels:

- Click on a panel and keep the "Ctrl"/"Cmd" key pressed.
- Click on further panels in order to select them. The selected panels are highlighted in color.

or

- Click on the background while keeping the left mouse button pressed.
- With the mouse pointer, draw a rectangle over the desired panels. The selected panels are highlighted in color.

Devices Tools Messages

Changing the graphical representation of panels

The WSM allows you to choose between different settings and graphical representations for the panels.

Changing the graphical representation of a panel

To change the graphical representation for a panel:



- Right-click on the panel.
 A shortcut menu appears.
- Click on "View Style".

The submenu containing different panel styles appears.

Select a panel style:



- The panel style for a "transmitter" panel depends on the device settings.
 - When you considerably zoom out a panel, the scales are hidden to provide a better overview.

Selecting an icon for a panel

To provide for a better overview, you can assign an icon corresponding to the instrument or a number to each panel. Alternatively, you can assign pictures – e.g. photos of the performers.

To select an icon for a panel:

Channel Applications Help	G
Channel sorting	
Properties	
Tean	📝 Trumpet
New label	🕎 Guitar
	Vocal
"Identify channel" is not supported	🚮 Bass
Panel Color	Accordion
	🖉 Flute
Use Panel Settings As Default	🖉 Clarinet
Use Default Panel Settings	Saxophone
Copy Ctrl+C	Percussion
Remove/Cut Ctrl+X	🚺 Trombone
	🎻 Violin
	Picture
en a la cola de la cala da la da la cala da la cala. Con la cala da	Set Number 🕨 🕨
******************	No icon

- Click on the desired panel.
- Click on "Channel" > "Icon".A submenu appears.
- Select one of the icons. The icon appears in the upper left corner of the selected panel. or:
- Click on "Set Number" and select a number between 1 and 50. The number appears in the upper left corner of the selected panel.
 - or:
- Click on "Icon".

The "Open" window of your operating system appears.

- Select a graphic or a picture.
- Click on "Open".
 - The picture appears in the upper left corner of the selected panel.



Channel	
Channel sorting	
Properties	
View Style	×
lcon	۲
New label	
"Identify the channel" is no	tsupported
Panel Color	
Use Panel Settings As Defa	ılt
Use Default Panel Settings	
Сору	Ctrl+C
Remove/Cut	Ctrl+X

Changing the color of a panel

To assign a color to the border of the panel:

- Click on the desired panel.
- Click on "Channel" > "Panel Color". The "Panel Color" window appears.
- Select a color and click on "OK". The window closes. The border color of the panel is changed.

Defining standard panel settings and applying them

To define standard panel settings:

- Set up a panel as desired.
- Click on the panel.

Channel	
Channel sorting	
Properties	
View Style	E.
lcon	F
New label	
"Identify the channel" is not sup	oported
Panel Color	
Use Panel Settings As Default Use Default Panel Settings	
Сору	Ctrl+C
Remove/Cut	Ctrl+X

Click on "Channel" > "Use Panel Settings As Default". The settings such as panel style, size, icon and color of the selected panel are saved.

To apply the last saved standard panel settings to the panels:

- Select one or several panels.
- Click on "Channel" > "Use Default Panel Settings". The settings such as panel style, size, icon and color are applied to the selected panels.

Aligning and moving panels

Moving panels

- Click on a panel or select several panels.
- Keep the left mouse button pressed and drag the panel(s) to the desired position.

Aligning panels to the grid

- Click on "View" > "Show Grid" to show the grid. The grid is shown.
- Click on the panel and keep the mouse button pressed.
- Drag the panel to the desired position in the scene. If the "Snap to grid" menu item is activated, the panel is automatically aligned to the grid.

Arranging panels automatically

Click on "View" > "Auto Arrange".

A tick appears in front of the menu item. The panels are arranged side by side.

Adding a panel to a different scene

Select one or several panels.

To copy or cut a panel:

- Click on "Channel" > "Copy" or "Remove/Cut".
- Click on the tab of the desired scene. The scene appears on the display area.

Click on "Channel" > "Paste". The panel appears in the selected scene.

Sorting panels for multi-channel systems

The following function allows you to conveniently determine the sequence of the panels for devices of the ew G3 and 2000 series and EM 3732-II receivers.

EM 9046 receivers are automatically sorted according to their channels.

Channel	
Channel sorting	
Properties	
View Style	•
lcon	٠
New label	
"Identify the channel"	is not supported
Panel Color	
Use Panel Settings As I	Default
Use Default Panel Setti	ngs
Сору	Ctrl+C
Remove/Cut	Ctrl+X



Channel sorting	
Properties	
View Style	
lcon	
New label	
"Identify the channel" is	not supported
Panel Color	
Use Panel Settings As De	ault
Use Default Panel Setting	
Сору	Ctrl+
Remove/Cut	Ctrl+.

To change the sequence of the panels:

Click on "Channel" > "Channel sorting ...". The "Channel Sorting" window appears.

ĺ.			Cha	annel Sorting		
Sor	ting your chann Please press " able to re-arra	els easily(Step Sync" for at lea Inge all channe	ast 1.5 sec at all channels con Is by drag & drop.	secutively to define	the order (EM373x/e	wG3/2000 devices only). You are
1 2 3 4 5 6 7 8	New order	Name CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH6	Frequency range 470.000 - 494.000 MHz 470.000 - 494.000 MHz	Frequency 470.100 MHz 472.400 MHz 473.675 MHz 474.930 MHz 476.300 MHz 476.300 MHz 477.600 MHz 478.875 MHz 480.300 MHz	Device type EM9046 [EM9046] EM9046 [EM9046] EM9046 [EM9046] EM9046 [EM9046] EM9046 [EM9046] EM9046 [EM9046] EM9046 [EM9046]	Position Re1 Re2 Re3 Re4 Re5 Re7 Re6 Re7 Re8
						Next > Cancel

Follow the instructions of the wizard.

Identifying channels

The "Identify channels" function allows you to quickly identify connected devices of the ew G3 and 2000 series and EM 3732-II receivers.

- Click on a panel.
- Click on "Channel" > "Identify Channel". "Identified" appears on the display of the selected device.

nnel	
Channel sorting	
Properties	
View Style	
lcon	
New label	
"Identify the channel" is	not supported
Panel Color	_
Use Panel Settings As De	fault
Use Default Panel Setting	gs
Сору	Ctrl+
Persona/Cut	Ctrl+

Panel commentary (label)

You can paste labels into the panels to provide a better overview. The labels can be freely dragged.

Pasting labels

 Right-click on the panel. A shortcut menu appears.



Click on "New Label".
 A label appears in the panel.



Enter your commentary. The font size is automatically adjusted to the size of the label. You cannot re-size the label, as the label size is dependent on the panel size.

To change the text at a later time:

- Right-click on the label.
 A shortcut menu appears.
- Click on "Edit".

The cursor appears in the label.

Dragging labels

- Click on the label. The move symbol appears.
- Move the label to the desired position.





Deleting labels

- Right-click on the panel. A shortcut menu appears.
- Click on "Delete".
 The label is deleted.

Deleting panels

To remove unused panels from the display area:

Right-click on the panel.

A shortcut menu appears.



Click on "Remove/Cut".

The panel is deleted. The panel settings are lost. The set device parameters are retained. The eye end in the system window is removed for this scene.

To restore all panels:

Click on "System" > "Refresh Device List".

All stationary devices appear as panels with the default panel settings in the display area. The previous panel settings are lost.

To restore individual panels:

Read the chapter "Creating panels" on page 76.

Configuring devices

Configuring streaming

The WSM allows you listen to live audio streams received by EM 9046 receivers.

The WSM supports streaming of RTP/RTSP audio received by compatible EM 9046 receivers and also supports playback of Dante audio using Audinate's "Dante Virtual Soundcard" (DVS).

Dante Virtual Soundcard is a software that turns your computer into a Dante-enabled device, allowing Dante audio to be transmitted and received via its standard Ethernet port.

Streaming using RTP/RTSP



If the WSM is in online mode and an EM 9046 is connected to your computer, you can stream audio using the RTP/RTSP protocol and listen to it by clicking on the headphone icon on the EM 9046 channel strip.

A gray headphone icon indicates that the EM 9046 receiver is offline or that the firmware of the EM 9046 does not support RTP/RTSP streaming.

RTP/RTSP streaming is supported from the following EM 9046 firmware version: EM9046_3_0_3 (for how to update the EM 9046 firmware, see page 29).

To start RTP/RTSP steaming:

Click on the headphone icon.



The background of the icon turns blue, indicating that the stream is playing.



Using the RTP/RTSP streaming protocol (R) you can listen to one channel at a time. If you want to listen to more than one channel at a time, you have to use a Dante-enabled device.

Streaming using Dante

Required hardware

You require an EM 9046 receiver equipped with an EM9046 DAN module (a Dante module provided by Sennheiser).

Required software

For Dante playback, you require Dante Virtual Soundcard by Audinate. You additionally require the "AVS Firmware Updater" software developed by AuviTran to update the firmware of the EM 9046 DAN modules. The "AVS Firmware Updater" is only available for Windows.

Turning on Dante Virtual Soundcard

To turn on Dante Virtual Soundcard:

- Open the Dante Virtual Soundcard Control Panel.
- Click on the grayed out power on/off button.

The power on/off button turns green, indicating that Dante Virtual Soundcard is turned on (for more information, refer to the Dante Virtual Soundcard User Guide).



Using Dante in WSM

- Make sure that the EM 9046 with the installed Dante module is connected to the WSM and that Dante Virtual Soundcard is running.
- Make sure that all Dante hardware devices (including third-party Dante-enabled products) are configured in Unicast mode before you start streaming using Dante.

Mapping EM 9046 receivers to their corresponding Dante modules

Click on "System" > "Dante Mapping". The following window opens.



- Select the EM 9046 device from the first drop down list 1.
- Select the corresponding Dante module from the second drop down list 2.



If you map an EM 9046 to a wrong Dante module, streaming may not work properly.

1	Dante Mapping	
Select EM 9046 device	✓ Select Dante module	 Add
EM 9046 devices	Dante modules	 _
EM9046 (EM9046_1) -2	EM9046DA-04406c	
Delete		 Close
		close

- Click on "Add" 3 to map an EM 9046 receiver with its corresponding Dante module.
- Click on "Close".





Once all EM 9046 receivers are mapped to their corresponding Dante modules, the icon shown on the left appears on all EM 9046 channels strips.



Required settings in the Windows Control Panel

To configure your Windows PC:

Right-click on the speaker icon 2 at the bottom right corner of the screen of your Windows PC and select "Sounds". Then click the "Recording" 4 tab.

Select a i	ecording dev	vice below t	o modify its setting	IS:	Values	6	in a next	able music pla	une ar athar davies t	hrough
	 DVS Rece Dante Vii Ready 	eive 1-2 rtual Sound rtual Sound eive 5-6 rtual Sound eive 7-8 rtual Sound rtual Sound	icard icard icard icard icard		this D\ hear fe List Playba Defau Powe © Ct D	/S Receivedback. een to thi ck throu It Playba er Manag ontinue isable au	is device igh this c ack Devic gement running utomatica	k. If you cont	ery power wer	ou may
Config	ure		Set Default	Properties						

- Double-click on "DVS Receive 1-2" 5.
- Click on the "Listen" tab 6 in the "DVS Receive 1-2 Properties" window.
- Activate the "Listen to this device" check box 7.

- Ensure that "Default playback device" 8 or your desired output device is selected.
- Click on "OK".

To start streaming:

Click on the icon on one of the EM 9046 channel strips.



The background of the icon turns blue, indicating that the stream is playing.



Selecting the audio mode (mono or stereo) for a Dante stream

To select the audio mode for your Dante stream:

- Click on "System" > "Dante Audio Mode".
- Select "Stereo" to play the stream in stereo mode.
 - The EM 9046 channels are mono so that the second channel of a stereo stream is muted when streaming directly to the computer/WSM. However, if you first route your audio stream from the EM 9046 to a Dante-enabled mixing console, you can create a stereo mix which can then be played in stereo.

or:

Select "Mono" to play the stream in mono (the stream is played on both channels of the output device).



Setting parameters in the "Properties" window

You can configure stationary devices and the corresponding portable devices using the "Properties" window. To do so, select one or several panels (see page 76).

Displaying an overview of parameters

To display the parameters of the selected device:

 Right-click on a panel. The shortcut menu appears.



Click on "Properties" or "Common Properties".

The "Properties" window opens. The parameters for the device appear in the left column ("Name"). To the right, the associated values ("Value") and units ("Units") are shown.

erties		1000		Properties		
Name	Value	Unit	*	Name	Value	Unit
ame	Back			Name	SPARE	
nk	U1			Bank	U	*
annel	1			Channel	1	*
quency	813.050	MHz		Frequency	848.375	MHz
uelch	9	dB	E .	Lower frequency limit	830.000	MHz
wer frequency limit	790.000	MHz		Upper frequency limit	866.000	MHz
per frequency limit	865.000	MHz		Display	Name	*
out	0	dB		Sensitivity	0	▼ dB
ualizer	Low Cut + High Boost	•		Mode	Mono	*
Mute	Off			Lock mode	Off	
ot tone	Active	-		Frequency list		
to lock	Inactive			 EK300 parameters 		
arning AF peak	Active	•		Pilottone		*
arning Low Battery	Active			Lock mode		•
arning Low RF Signal	Active	•		Limiter		*
arning RF mute	Active			Squelch		•
arning Tx mute	Inactive	•		Stereo/Focus		*
arning Rx mute	Active			Equalizer		*
equency list				Display		*
nc settings SK			100			
Auto lock	Ignore					
Sensitivity SK	Ignore	dB				

If you have selected several devices, only the identical, i.e common, parameters of the devices are displayed. All other fields contain no information.

fäne	Value		Unit.	
Name	£M9046	-		
Presete	40,1	-		1.111
Frequency		Miriz		
Command Mode	add	•		
Encryption	ott	*	-	
Channel State	normal		Spare f	requency ?
🗧 Sync Settings Ta				
Attenuation	-6	* di	Please select a spare frequ	uency. To set your device t
- low cut	30		the new mequency, cutic a	
Display	Name		489,250 MHz	
Lock	off		HUNGO INTE	
Cable emulation	UNE			
RF Mode	[IR	*		
				Cancel Set

Using spare frequencies from the "life belt" option

i

The "life belt" icon in the "Properties" window is only enabled if you have configured your system using "Professional Setup" (see page 41), i.e. if

- you have allocated coordinated frequencies as spare frequencies,
- the spare frequencies are within the frequency range of the device,
- the system region of the spare frequencies is the same as the system region of the device and
- the device type of the spare frequency is the same as the device type of the device.

The "life belt" icon provides access to the "Spare frequency" dialog which lists the pre-coordinated spare frequencies that can be used if the operating frequency of your system is disturbed or interfered with.



If you select a spare frequency from the "Spare frequency" dialog, this frequency is removed from the "Spare frequencies" dialog and assigned to the device in the "Properties" window.

	Properti	es			100	
Name	Value	1		Unit	-	
Name	EM9046	-			and the second second	
Presett	40.1	٠	-			
Frequency			MHz			
Command Mode	add	•			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Encryption	att					
Channel State	pornal		1			
Sync Settings Tr						
Attenuation	-6	•	d13			
Low cut	30		Hz	14	Spare frequency	7
Display	Name	•	1			
Lock	off	•		Fidner, set	ect a spare frequency. To set yo	sur devide
Cable emulation	LINE			- Franking	additional prove set a	
RF Mode	μя	-		494,000 54	Fig (distant fragmeny)	ĺ
-	_	0 -		Cancel	Cancel Acchy	Set



If there are no spare frequencies available for the frequency range, the life belt icon in the "Properties" window is disabled.

Changing the parameters of a device

Before you can change parameters, you must activate the "Remote Access" menu item:

- Click on "System" and check if the "Remote Access" command is ticked.
- If "Remote Access" is not ticked:
- Click on "Remote Access".

You may be requested to enter a password (see page 10). A tick appears in front of the menu item. A red dot appears in the panel. When you call up the "Properties" window (see next section), "Remote Active" is displayed in the lower part of the window.

The parameters that you can change depend on the respective device type. Specific information on the parameters can be found in the instruction manuals for the devices.

Line highlighted in	Meaning
white	You can change these parameters.
	• The data transfer to the devices was successful.
yellow	• The parameter has been changed but has not yet been transfered to the devices.

- Click on the arrow next to the corresponding parameter. A selection list appears.
- Select the desired value.
- Click on "OK".

The window closes; the new parameters are transfered to the corresponding device

• The frequency of the device can only be changed when the channel bank "U" is selected.

• If you have selected several panels, you can simultaneously change the parameters of the selected devices.



dih

Recording the field strength using the tools

The "RF Spectrum Analyzer" tool

The "RF Spectrum Analyzer" tool allows you to get a clear picture of the frequency spectrum on location and provides you with all the necessary information for planning your wireless system – more up to date and reliable than any list

- If you want to use the "RF Spectrum Analyzer" tool during live operation, select a receiver that is not required in the transmission.
 - After you have completed the measurement with the "RF Spectrum Analyzer", you have to set the frequency of the receiver again.

Calling up the "RF Spectrum Analyzer"

- ▶ In the system window, click on the "Tools" tab.
- Click on the "RF Spectrum Analyzer" icon.
- Keep the mouse button pressed and drag the icon in the scene. The "RF Spectrum Analyzer" window appears in the scene.



The "RF Spectrum Analyzer" window

- 6 Toolbar
- 6 Selection area
- Recording bar
- (8) "RF Level" window (display range of up to 40 dB max.)
- 9 "Memory", "Found Frequencies" and "Frequency (MHz)" displays
- Display of the current date and time
- "Comment" field
- Buttons of the "Memory", "Marker" and "Zoom" group

6 Selection area



In the selection area, you can:

- select a stationary receiver (see page 98),
- select the frequency range (see page 99) and
- preset the start time for the recording (see page 98).

8 "RF Level" window



This window displays the measured field strength of the different frequencies within the receiver's frequency range as vertical bars (display range of up to 40 dB).

The set squelch threshold is given as a reference. The squelch threshold is shown as a horizontal dotted line.

Color	Meaning
green	"free": The field strength is below the squelch threshold and is displayed as an unused frequency.
red	"occupied": The field strength is above the squelch threshold and is displayed as an occupied frequency.
yellow	"squelch": Squelch threshold

The squelch threshold can be adjusted in the "Parameter" window (see "Setting parameters in the "Properties" window" on page 89).



"Found Frequencies" display

The "Found Frequencies" displays the occupied frequencies detected during the recording as red squares.

"Frequency (MHz)" display

The frequencies are shown on the x-axis of the "Frequency (MHz)" line. The frequency range depends on the selected receiver and the setting made under "Set Frequencies".

"Memory" display

The "Memory" display is only shown if a recording from the temporary memory is displayed (see "Temporarily saving recordings and comparing them" on page 103).

Markers and comments



Important occurrences can be marked and commented. The markers are displayed as vertical blue lines. A blue flag appears above them. When you click on a marker, the line and the flag turn to orange. When you move the mouse pointer over a marker, a box will appear above the marker, indicating the time and the measured field strength of both antennas.



When you have clicked on a marker, you can enter a comment in the "Comment" field. A "C" appears in the flag of the marker. The comment is displayed again when you click on the marker (see "Marking measured values and commenting on them" on page 104).

Display of the current date and time



The current date and time are displayed. Date and time are taken from the operating system.

The "RF Level Recorder" tool

The "RF Level Recorder" tool allows you to check the reception quality of your wireless microphone system. You can record the field strength of any transmitter in any area of the stage and, if necessary, optimize the antenna positions using the detailed graphical representation provided by the tool.

Calling up the "RF Level Recorder"



- In the system window, click on the "Tools" tab.
- Click on the "RF Level Recorder" icon.
- Keep the mouse button pressed and drag the icon in the scene. The "RF Level Recorder" window appears in the scene.



The "RF Level Recorder" window

- 6 Toolbar
- 6 Selection area
- Recording bar
- 8 "RF Level" window (display range of up to 40 dB max.)
- "Memory", "Diversity" and "Rec Time" displays
- 10 Display of the current date and time and the set recording duration
- "Comment" field
- Buttons of the "Memory", "Marker" and "Zoom" group

6 Selection area

Receiver	Set time			Duration
EM2050G3 925, 125 MHz	Now	3/13/13 12:00 PM	~	1 min 🔻

In the selection area, you can:

- select a stationary receiver (see page 98),
- preset the start time for the recording (see page 98) and
- set the recording duration (see page 98).

8 "RF Level" window

This window displays the field strength of the receiver's diversity channels over a defined period of time.



The measured values of the field strength "RF Level" are displayed as colored bars over the defined measuring duration. Field strength levels of up to 40 dB max. can be displayed.

free occupied squelch		squelch	Color	Meaning
			red	Diversity channel Antenna I/Antenna A
			green	Diversity channel Antenna II/Antenna B
			yellow	Squelch threshold

"Memory" display

The "Memory" display is only shown if a recording from the temporary memory is displayed (see "Temporarily saving recordings and comparing them" on page 103).

"Rec Time" display

The measuring duration is shown together with the current time on the x-axis of the "Rec Time" line. The measuring duration depends on the setting made under "Duration" (see "Setting the recording duration – "RF Level Recorder" only" on page 98).

"Diversity" display

The colored bars in the "Diversity" line display the active diversity section.

Color	Meaning
red	The measured field strength of "Antenna I" / "Antenna A" is higher than that of "Antenna II" / "Antenna B"
green	The measured field strength of "Antenna II" / "Antenna B" is higher than that of "Antenna I" / "Antenna A"
white	The measured field strength of both antennas is below the squelch threshold; the receiver is muted

Example:

At 15:00 o'clock, the bar is green, i.e. antenna I/A is active. At 16:00 o'clock, the field strength of antenna II/B is stronger. Antenna II/B becomes active and the bar in the "Diversity" line is displayed in red.

Markers and comments

Important occurrences can be marked and commented. The markers are displayed as vertical blue lines. A blue flag appears above them.

When you click on a marker, the line and the flag turn to orange. When you move the mouse pointer over a marker, a box will appear above the marker, indicating the time and the measured field strength of both antennas.



When you have clicked on a marker, you can enter a comment in the "Comment" field. A "C" appears in the flag of the marker. The comment is displayed again when you click on the marker (see "Marking measured values and commenting on them" on page 104).



Display of the current date and time and the recording duration



The current time, the date and the recording duration are displayed. Time and date are taken from the operating system. The recording duration is set under "Duration" (see "Setting the recording duration – "RF Level Recorder" only" on page 98).

Working with the tools

Selecting a stationary receiver for the recording

You can do the recording with any stationary receiver.

To select a stationary receiver:

Click on the arrow in the "Receiver" field.

A list of the connected receivers with their respective frequency ranges appears.

Select the desired receiver by clicking on it.

Presetting the start time for the recording

You can either start the recording immediately, or you can preset a start time.

To preset a start time for the recording:

Click on the arrow in the "Set Time" field. A window that contains a calendar and the current time appears.



- Click on the arrows to the left and right of the month to change the month and the year.
- Click on the day to select the date to be entered into the date field.
- Enter the time directly in the "Time:" field.
- Make sure that all relevant devices for the recording are switched on at that time and that the WSM is running
 - If you want to use the "Spectrum Analyzer" tool during live operation, select a receiver that is not required in the transmission.

Setting the recording duration – "RF Level Recorder" only

You can select a recording duration from 1 minute to 24 hours.

To set the recording duration:

Click on the arrow in the "Duration" field.
 A selection list appears.



Select the recording duration from the list. The selected value appears in the "Duration" field.



Duration

•

1 min

Setting the frequencies – "RF Spectrum Analyzer" only



Set frequency

Range Range Preset TV chann To manually set the frequency range to be recorded:

- Click on the arrow in the "Set Frequency" field. A selection list appears.
- Select one of the following menu items:
 - "Range" to set the upper and lower limit of a frequency range (see page 99)
 - "Preset" to select the channel bank of a receiver (see page 99)
 - "TV Channel" to select the TV channels (frequencies) to be taken into account during the recording (see page 100)

Setting the upper and lower limit of the frequency range (Range)

You can set the upper and lower limit of the frequency range to be recorded. Both frequencies must be within the frequency range of the receiver.

Click on "Range".

The "Frequency Range" window appears.

Start frequency:	
790.000	-
Stop frequency:	
865.000	

Click on the arrow in the "Start" field.

A list of frequencies from the frequency range appears.

Frequency range	
Start frequency:	
790.000	•
790,000	
790,025	
790.050	
790.075	
790.100	
790.125	
790.150	
790.175	

- Select the lower limit.
- Click on the arrow in the "Stop" field to select the upper limit.
- Click on "OK".

The dialog box closes. The "Frequency (MHz)" display (x-axis) is scaled to the selected frequency range. Only the selected frequency range is recorded.

Selecting a channel bank of a receiver (Preset)

You can select a channel bank of a receiver in order to only record the frequency range of this channel bank.

Set Frequenc	y
Preset	
Range	
Preset TV Channel	

 Click on "Preset". The "Preset" window appears.

Example EM 3732:



Select a channel bank (e.g. "Bank 1") by clicking on it. The "Frequency (MHz)" display (x-axis) is scaled to the frequency range of the selected channel bank.

Only the frequencies in the selected channel bank are recorded.

Selecting TV frequencies (TV Channel)

You can select TV frequencies from within the device's frequency range to be taken into account during the recording.

- Set frequency
 Range
 Range
 Preset
 TV channel
- Click on "TV Channel".

The "TV channels" window appears.

TV channel 47(782-790)	Country :
 TV channel 48(790-798) TV channel 49(798-806) TV channel 50(806-814) TV channel 51(814-822) 	China

Click on "Country" and select an entry.



- Activate the desired check box to select the TV frequencies to be recorded.
- A tick appears.
- Click on "OK".

The dialog box closes. The selected TV frequencies are taken into account during the recording.

Buttons in the toolbar	Function of the button
	Opens a saved recording.
H	Saves the current recording under the same name.
	Saves the current recording under a new name.
8	Prints the contents of the "RF Level" window of the current recording (up to 40 dB max.).
Buttons in the recording bar	Function of the button
	Starts a recording.
	Cancels the recording.
	Cancels the recording. Interrupts the recording.

Overview of the buttons of the tools

Buttons in the "Memory" group	Function of the button
Сору	Copies the current recording to the temporary memory.
Clear	Deletes the recording from the temporary memory.
Show	Displays the recording from the temporary memory.
Hide	Hides the recording from the temporary memory.
Buttons in the "Marker" group	Function of the button
Set	Places a marker on a measuring value in the "RF Level" window.
Delete	Deletes a marker from the "RF Level" window.
Show	Shows all markers.
Hide	Hides all markers.
Search RF peak	Searches and jumps to the measured peak values.
Search low RF	Searches and jumps to values below the squelch threshold.

Starting the field strength recording

After you have set the recording duration, you can start the field strength recording.

To start the recording:



- Click on the "Now" option button under "Set Time".
- Click on "Start".

If you have not yet saved the last recording, you will be asked if you want to save it (see "Saving recording data" on page 105).

Interrupting the field strength recording

To interrupt the recording:

Click on "Pause". The field strength levels are not recorded during this time. Only the "Squelch" bar continues to move. The recording duration is not changed by an interruption.

To continue the recording:



Canceling the field strength recording

To cancel the recording:



To start a new recording and to overwrite the cancelled recording:

Click on "Start".

Deleting the last field strength recording

To delete the last recording:

Click on "Clear".

The recording is deleted form the memory and from the "RF Level" window.

Zooming the "RF Level" window in/out

The "Zoom" function allows you to zoom the "RF Level" window in and out. A zoomed-out window provides a better overview, a zoomed-in window shows details.

To zoom the "RF window" in:

T	

Zoom

Click on the "+" button. The "RF window" is zoomed in. The scroll bar is automatically adjusted.

To zoom the "RF window" out:

Click on the "–" button.

The "RF window" is zoomed out. The scroll bar is automatically adjusted.

Temporarily saving recordings and comparing them



The "Memory" function allows you to temporarily save recordings. The measured values (bars) of the previous recording are displayed lighter. The superimposed measured values of the current recording a displayed darker. This allows you to compare two recordings.

Temporarily saving a recording

Click on "Copy".

The measured values are copied to the temporary memory. The comments and markers are not taken over.

After you have made another recording, you can show the previous recording by clicking on "Show" and directly compare the two recordings.

Showing the recording from the temporary memory

Click on "Show".

The "Memory" line appears. The "Memory" line shows the colored bars displaying the respective active diversity section as shown before in the "Diversity" line.

The "RF Level" window displays the measured values (bars) of the recording from the temporary memory. These bars are displayed lighter while the superimposed bars of the current recording a displayed darker.



Hiding the recording from the temporary memory



Clear

Click on "Hide".

The measured values (bars) of the recording from the temporary memory are hidden but are retained in memory.

Deleting the recording from the temporary memory

Click on "Clear".

The measured values (bars) of the recording from the temporary memory disappear from the "RF Level" window and are deleted from the temporary memory.

Show

Сору

Marker Set Show	In order to be able to better evaluate the measured values of a recording, you can use the "Marker" function. This allows you to mark the measured values and provide them with a comment.
Delete Hide	To mark a measured value and comment on it:
Set	Click on "Set".
	The mouse pointer changes to a cross.
	Move the cross to the measured value you want to mark. Place a marker by disking on the measured value.
	The marker is displayed as a blue line with a blue flag.
	Enter your comment into the "Comment" field. Subsequently, a "C" appears in the flag.
	Comment Level OK
	To delete a marker:
Delete	Click on the marker.
	Click on "Delete". The marker and the corresponding comment are deleted.
	To hide all markers:
Hide	Click on "Hide".
	The markers are hidden.
	lo show all markers:
Show	The markers are shown.
	To show a comment on a marker:
	Click on the marker. The color of the marker changes to orange. The comment is shown in the "Comment" field. You can change or add to your comment by clicking in the "Comment" field and entering your changes.
	Comment Level OK
	Finding minimum and maximum values
	Searching for the minimum field strength – "RF Level Recorder" only
	The "RF Level Recorder" allows you to search for measured field strength values that are below the squelch threshold. The search always refers to the measured values of both antennas.
Search low RF	Click on "Search Low RF".
	The lowest measured field strength value that is below the squelch threshold is displayed. A marker appears at this point.

Marking measured values and commenting on them

Click again on "Search Low RF" to search for the next higher measured value.

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Searching for the maximum field strength - "RF Spectrum Analyzer" only

The "RF Spectrum Analyzer" allows you to search for field strength peaks.

- Click on "Search RF Peak". The highest measured field strength value is displayed. A marker appears at this point.
- Click again on "Search RF Peak" to search for the next lower measured value.

Saving recording data

You can save the data of a recording as a CSV file. You can open and edit this file with any spread sheet program. Make a copy of the CSV file before editing it.

To save a file:

Click on "Save".

上

0		
-	1	
	/	

When the recording has not yet been saved, the "Save As..." window appears automatically.

To save a file under a new name:

Click on "Save as".

The data is saved.

The "Save As..." window appears. The WSM proposes the "Data" folder in the program folder.

- If necessary, select a different folder in which to save the file.
- Enter a file name.
- Click on "Save".

The measured values, markers and comments are saved. The dialog box closes.

Loading previously saved recording data

To load a previously saved recording (CSV file):

- Click on "Open".
 - The "Open" window appears.
 - Select the desired file.
 - Click on "OK". The saved recording is loaded and appears in the "RF Level" window.

Printing recording data

Click on "Print".

To print the current "RF Spectrum Analyzer" window:

8

- The "Print" window appears.
- Configure your printer and click on "Print". The current "RF Spectrum Analyzer" window is printed.

Search RF peak

If a problem occurs

If a problem occurs that cannot be solved with the proposed solutions:

• Register on the Sennheiser website at www.sennheiser.com and describe the problem in the "Support" section

or

• contact your local Sennheiser partner.

Hardware

- First check the connections and cables of the devices.
- Check if all devices are switched on.

Software

The firmware update has failed (displays of the devices remain dark)

SKM 5200, SK 5212 and SKP 3000

- Start the updating process as described in the section "Updating the firmware of the devices" on page 29.
- Slide the multi-function switch upwards or to the right (UP) and keep it in this position (SKM 5200 and SK 5212) or press the "ON/OFF" button (SKP 3000) and keep it pressed.
- Briefly interrupt the power supply by pushing the batteries/accupack against the contact spring in the battery compartment.
- Place the device again in front of the infrared interface. The WSM displays a status bar. The firmware is updated.
- Release the multi-function switch (SKM 5200 and SK 5212) or the "ON/ OFF" button (SKP 3000).

Stationary devices of the ew G3 and 2000 series

Start the updating process as described in the section "Updating the firmware of the devices" on page 29.



hoose firmware package The default firmware package in the N	lew_Releases folder is displayed. Click "Choose" if you wish to choose a different firmware packaç
Firmware package	
The default firmware package is:	
	ewg3_1.2.sennpkg
The selected firmware package is:	
ewg3_1.2.sennpkg	Choose
Please select the mode for th	e firmware update. For the recovery of devices with crashed device choose Recovery Mode.

▶ Select "Recovery Mode" in the resulting window and click on "Next >".

- Select the "Stationary device" option.
- From the selection field, select the device type.

		Version:			
Stationary device		() Portable device		
Select device to recover:	< <none selected="">> 🔽</none>				
	EM300G3				
	EM500G3 SR-IEM300G3				
Click "Start" and then hold	i the set button at the rec	overy device while			
connecting power supply					

- Click on "Start".
- Disconnect the device in question from the mains.
- ► Keep the "SET" button pressed.
- Reconnect the mains plug.

The WSM displays a status bar. The firmware is updated.

Release the "SET" button.

Portable devices of the ew G3 and 2000 series

Start the updating process as described in the section "Updating the firmware of the devices" on page 29.
r innware update	
Choose firmware package The default firmware packa	e in the New_Releases folder is displayed. Click "Choose" if you wish to choose a different firmware package.
Firmware package	
The default firmware packag	is:
	ewg3_1.2.sennpkg
The selected firmware packa	e is:
ewg3_1.2.sennpkg	Choose
Please select the r	ode for the firmware update. For the recovery of devices with crashed device choose Recovery Mode.
Please select the r	ode for the firmware update. For the recovery of devices with crashed device choose Recovery Mode.

▶ Select "Recovery Mode" in the resulting window and click on "Next >".

Select the "Portable device" option.

		Version:
O Stationary device		Portable device
Select device to recover:	< <none selected="">> V</none>	Select a stationary device as interface to recover the firmware of portable device
	EK-1EM300G3 SK300G3 SKM300G3 SK500G3 SK500G3 SKM500G3	EM2050 (EM2050, 516-400 MHz) SR30063 (ew3001EM, 605.000 MHz)
Click "Start" and then ho	d the set button at the recovery devi	ce while
connecting power supply	a the set button at the recovery devi	

- From the selection field, select a stationary device.
- In the right hand list, click on the affected portable device. "Sync" appears on the display of the selected device.

		Version: 1.2.0
O Stationary device		Portable device
Select device to recover: SK300G3		Select a stationary device as interface to recover the firmware of portable device
		EM2050 (EM2050, 516, 400 MHz) SR30053 (au3001EM, 605,000 MHz)
Click "Start" and then hold the set but connecting power supply	tton at the recovery dev	ice while

- Click on "Start".
- ► Keep the "SET" button pressed.

- Briefly interrupt the power supply by pushing the batteries/accupack against the contact spring in the battery compartment.
- Place the device in question in front of the stationary device with the "Sync" display.
 - The WSM displays a status bar. The firmware is updated.
- Release the "SET" button.

The program does not launch

- Check that your PC satisfies the system requirements (see "System requirements" on page 5).
- Check the settings of your firewall; the WSM may be blocked by a setting.

The receiver panel does not appear

The firmware in the receiver has not yet been updated.

Update the firmware in the receiver (see "Working with scenes" on page 72).

Device is not found

Device is switched off

Switch on the device.

Firewall blocks the WSM

Enable the corresponding ports for the WSM.

Device is separated by a router

Manually register the device with the WSM (see page 11).

Glossary

ASIO

Audio Stream Input/Output (ASIO) is a computer sound card driver protocol for digital audio specified by Steinberg, providing a low-latency and high fidelity interface between a software application and a computer's sound card. ASIO allows musicians and sound engineers to access external hardware directly. Interface support is normally restricted to Microsoft Windows.

Deviation

Modulation deviation; modulation of the transmitter

Easy Setup

Function for allocating unused frequencies; a frequency preset scan can be performed to check all factory preset frequencies (presets). The spectrum of the selected frequency range is only checked selectively.

Firmware

Software that resides on a chip in the device. It can and, sometimes, must be updated. Updates can be downloaded from the Sennheiser website.

Frequency preset scan

Function for detecting (identifying) unused and occupied frequencies in the immediate vicinity.

The spectrum of the selected frequency range is checked selectively, i.e. only the factory preset frequencies (presets) and the frequencies stored in the channel bank "U" are checked.

The detected unused frequencies can be allocated to the devices manually or automatically.

Frequency scan

Function for detecting (identifying) unused and occupied frequencies in the immediate vicinity. The complete spectrum of the selected frequency range is checked. The detected intermodulation-free frequencies can be allocated to the devices manually or automatically.

Intermodulation

Interference due to intermodulation can occur if at least 2 transmitters close to the receiving antenna produce high input signals in the receiver. The two high frequencies generate intermodulation products at non-linearities in the receiver (e.g. in the mixer). This can also occur if 2 transmitters are operated too close to one another. Fully new frequencies result from this which may interfere with the system's other usable frequencies.

Panels

Each panel displays a channel. The panels contain, among other information, the name of the device, the current frequency and the field strength display.

Presets

Unchangeable, factory preset frequencies that are stored in the channels of a channel bank (except channel bank "U").

The frequencies within a channel bank are intermodulation-free.

Professional Setup

Function for allocating compatible frequencies; a frequency preset scan can be performed to check the complete spectrum of the selected frequency range; interfering frequencies from external devices can be excluded before the allocation of frequencies.

Squelch

Squelch is a circuit function that eliminates annoying noise (hissing noise) when the transmitter is switched off or when there is no longer sufficient RF power received by the receiver. The squelch suppresses all signals that fall below a certain threshold value. Only if a wanted signal of sufficient strength is received does the squelch open again.

WDM

The Windows Driver Model (WDM) is a framework for device drivers that was introduced with Windows 98 and Windows 2000.

WDM drivers are designed to be forward-compatible so that a WDM driver can run on a version of Windows newer than what the driver was initially written for, but doing that would mean that the driver cannot take advantage of any new features introduced with the new version.



Sennheiser electronic GmbH & Co. KG

Am Labor 1, 30900 Wedemark, Germany www.sennheiser.com

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